

# Coal Age

---

## HOW THE DSFA SEES ITS JOB

Selling Safety to New Miners • New Underground Shop at Old Ben  
Bulldozer Stripping • Air-Cleaning Fines • Making Meetings Pay  
Easier Barometric Surveying • Deepwell Turbines • Oil Dustproofing

# NO OTHER HAULAGE SYSTEM LASTS LIKE...

# MINE CARS

15 YEARS...19 YEARS...22 YEARS...**MORE!**

Can you imagine any other haulage system going that long without extensive major repairs? Yet mine cars are doing it in hundreds of the country's largest mines! Remember the other great advantage of mine cars, too: *no haulage shutdowns*. Unlike so-called 'continuous' haulage systems, constant-haulage mine car systems don't break down all at once. As long as you can cut the coal, mine cars will get it out!

If you're planning to modernize your transportation system, get all the facts about A.C.F. mine cars—costs, capacity maintenance, reliability. Your nearby A.C.F. Sales Representative can give them to you. American Car and Foundry Company, New York  
Chicago • St. Louis • Cleveland  
Philadelphia • Washington  
San Francisco • Berwick, Pa.  
Huntington, W. Va.



**A.C.F. MINE CARS**  
*for Constant Haulage*

# Only with B. F. Goodrich grommet belts can you make these savings!

*Save 3 ways! Investigate today!*  
*Write or mail coupon*

You save belt costs because belts last longer, save production costs because machines keep running with fewer interruptions, save maintenance costs because they need less attention.

Patented grommet belts by B. F. Goodrich represent the only basic change since invention of the V belt. Belts last 20 to 50 per cent longer, depending on service. (The more severe the service, the greater the increase over ordinary belts.) Grommet belts have more rubber; they're more flexible, give better grip, less slip.

#### *What is a grommet?*

A grommet is like a giant cable except that it's *endless*—a cord loop built up by winding heavy cord on itself. There is no overlapping cord section as in all ordinary belts. Most belt failures occur in these sections where cords overlap!

#### *All cords put to work*

Each of the two grommets and every part of a grommet carry their share of

the load. In ordinary belts under high tension the center cords "dish" because tension is greater near the driving faces. Dished cords are doing less work, not pulling their share. Grommet belts have no center cords, there is no dishing—therefore much more strength in proportion to cord volume—and less stretch. Grommet belts stretch, on an average, only about one-third as much as ordinary belts.

#### *Better grip, less slip*

Grommet belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give  $\frac{1}{2}$  more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

#### *Send for proof*

Send the coupon for a set of reports telling users' experiences and showing actual installations where grommet belts outlasted all others. Some typical cases:

"... within a few days ordinary belts had stretched ... After six months of 24-hour-a-day service BFG grommet belts haven't stretched at all ..."

"Ordinary belts lasted only 3 or 6 weeks ... B. F. Goodrich grommet belts are in their sixth month of service ..."

"Previous belts suffered from shock loads, wore out fast ... BFG grommet belts have been in service 2 years with no shut-downs ..."

There are hundreds of cases like these.

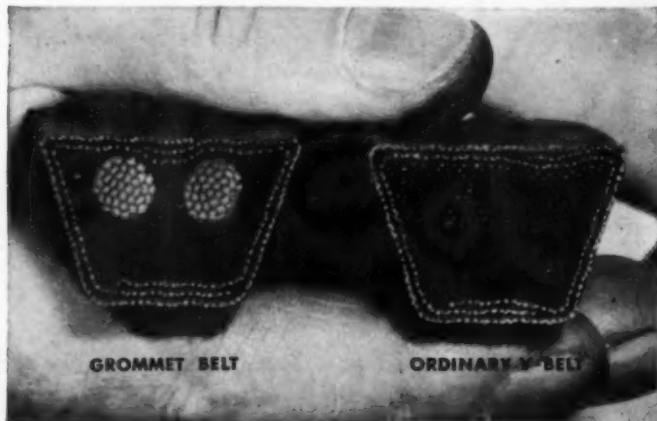
#### *They cost no more*

BFG grommet belts cost not one cent more than others. The savings they make for you are clear profit. They are made in C, D and E sections. They are patented by B. F. Goodrich. No other V belt is a grommet belt (U. S. Patent No. 2,233,294).

Write, send the coupon or see your B. F. Goodrich distributor. (He will show you his "X-ray" belt that shows the grommet construction clearly.)

*Grommet Belts* BY

**B.F. Goodrich**  
FIRST IN RUBBER



GROMMET BELT

ORDINARY V-BELT

The B. F. Goodrich Company  
Dept. CA-7  
Akron, Ohio

- ☐ Send set of reports telling users' experiences and showing actual installations proving that B. F. Goodrich grommet belts outlast all others.
- ☐ Have distributor show me the "X-ray" belt that shows how B. F. Goodrich grommet belts are made.

Name \_\_\_\_\_

Firm Name \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

# *The Champion*

**DOWN CAME A NEW WORLD'S RECORD**  
*when this bear crashed -*



It was only three years ago that Mr. Robert C. Reeve, of Anchorage, Alaska, brought down this monstrous Alaskan Brown Bear at Cold Bay. Bruin towered eight feet high and his skull measured  $19\frac{3}{4}$ ". He was—and still is—the World's Champion for size, according to the N. Y. Museum of Natural History. The Museum also owns the head of the biggest Bighorn Sheep ever shot, in 1920, in British Columbia, by Mr. James Simpson. The horns curve  $49\frac{1}{2}$ " and  $48\frac{1}{4}$ ", and spread  $23\frac{1}{2}$ ". If any bigger Bear or Bighorn Sheep was ever shot, the Museum would like to hear about it!

**HULBURT OIL & GREASE COMPANY, PHILADELPHIA, PA.**

*Specialists in Coal Mine Lubrication*

# *The Champion*

**...IN COAL MINE LUBRICATION**



## **Hulburt** *Quality* **GREASE**

*"The Champion"*

When you hunt for an end to your lubrication troubles—Hulburt Quality Grease looms BIG in the choice of experienced coal mine operators, because where trouble's "bruin" in lubrication, Hulburt stops it cold. Getting the right lubrication is sometimes more than just using Hulburt Grease, though. That's where the services of Hulburt Lubrication Engineers come in, right down in your coal mine. These trouble hunters know coal mining machinery. And they know the right way to get the best results with the ONE Grease made specifically for use in the coal mine—HULBURT.



**NEW LIGHT  
ON THAT  
FINE COAL  
DEWATERING  
PROBLEM**

**This BIRD gets the washed  
fine coal dry**

The Bird Coal Filter dewateres fine coal as completely as it has ever been done by mechanical means.

— **gets it all . . .** none of the washed fine coal goes by the Bird Coal Filter — only the high tail refuse is allowed to go to waste.

— **gets the water clean . . .** so clean that the water can be used as water supply to heat the filter.

— **and does the job at unbelievably low cost . . .** the Bird Coal Filter costs only \$100.00 per ton of run, dewatered product, labor, power, maintenance, everything. Maintenance average is under 2 cents per ton and is frequently under 1 cent.

**BIRD MACHINE COMPANY**  
SOUTH WALPOLE • MASSACHUSETTS

## CONTENTS • JULY • 1951

### THIS MONTH'S COVER

**WELL-PREPARED, EFFICIENTLY MINED COAL** like this may soon become the key to America's industrial might as the defense effort grows and the supply of other fuels tighten. Keeping your mine supplied with the equipment, supplies and manpower to do the job is one of the functions of the DSFA as outlined in the article beginning on p. 70.

### COMING IN AUGUST

**Economical Panel Mining** at Renton No. 3 mine of the Pittsburgh Coal Co., including use of large mine cars, efficient car feeders and prefabricated switches for increased output at lower cost.

**Versatile Central Shop** at The Hudson Coal Co. backs up modern mining methods with controlled, economical maintenance service.

**How Roof-Bolting** permitted revision of mining methods that jacked up output per underground man by 50% at the Melville No. 11 mine of the Hutchinson Coal Co.

**Multiple-Seam Mining**—What happens and why in mining contiguous coal seams, what factors are involved and what you guard against.

**Development and Operation** of a long-range pumping program at The New River Co. that has cut pumping labor 90% and power cost 25% in draining some 25 mi of workings.

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# ANTI-FRICTION BEARINGS LAST LONGER

**... when protected  
with TEXACO  
REGAL STARFAK**

Lubricate ball and roller bearings — in cutters, loaders, locomotives, electric motors, ventilating fans and other equipment — with *Texaco Regal Starfak*. They'll run better, last longer, cost less for maintenance.

Premium-quality *Texaco Regal Starfak* has extra-high resistance to oxidation, gum formation and separation — both in service and in storage. It keeps bearing temperatures normal,



## TEXACO LUBRICANTS



runs without drag, assuring power economy . . . won't leak out of bearings. You can count on *Texaco Regal Starfak* for an extra-long service life . . . for full protection under a wide temperature range.

For low-speed, heavy-duty, anti-friction bearings, use *Texaco Marfak*. It seals out dirt and moisture, seals in its effective lubricating film . . . guards against wear and rust . . . prolongs

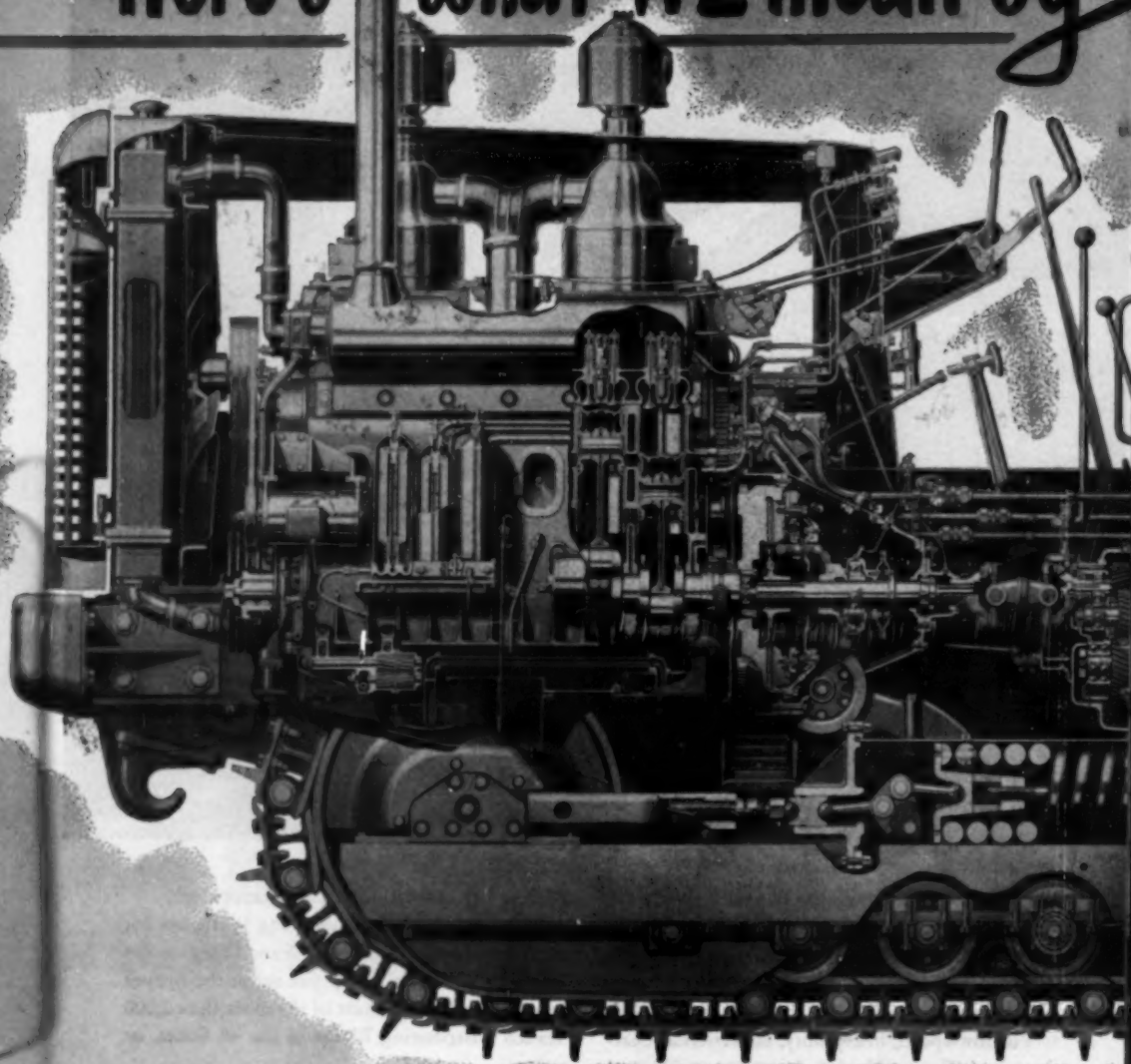
bearing life and reduces maintenance costs.

There are Texaco cost-reducing lubricants for all your mine machinery. A Texaco Lubrication Engineer will gladly help you select the proper ones. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

## For the Coal Mining Industry

# Here's what WE mean by



40.26 drawbar hp.  
11,250 lb.



70 drawbar hp.  
18,800 lb.



102 drawbar hp.  
27,850 lb.

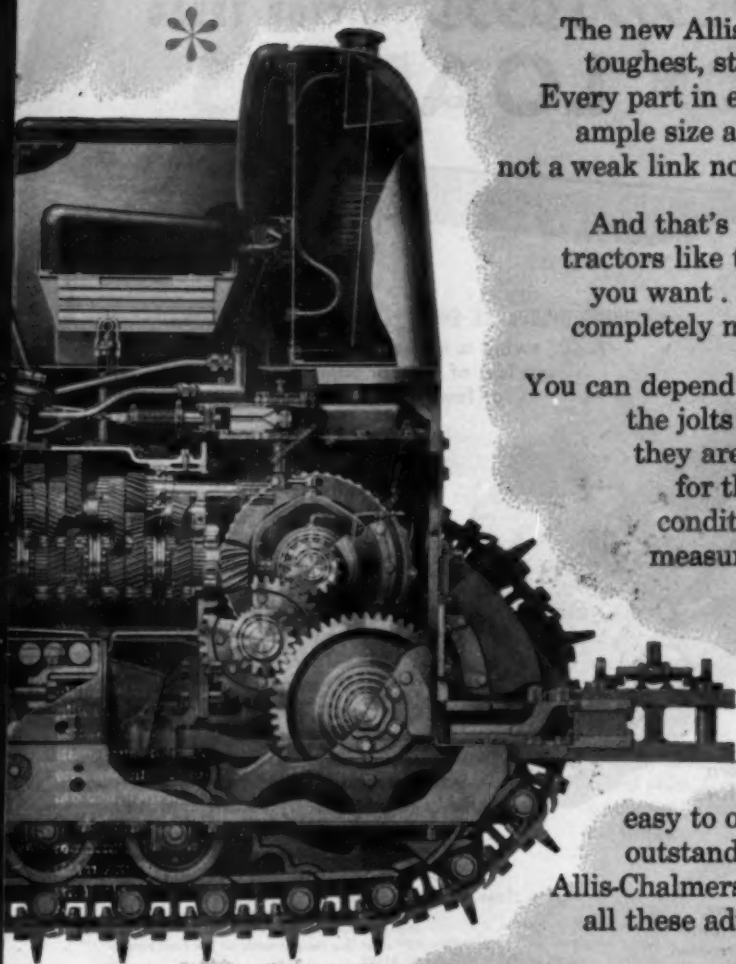


Hydraulic Torque Converter Drive  
175 net engine hp.  
41,000 lb.

## *The Newest, Finest Tractor Line on Earth!*

• DESIGNED FOR YOUR JOB • BUILT TO TAKE IT • EASY TO OPERATE • EASY TO SERVICE

# BUILT TO TAKE IT



The new Allis-Chalmers tractors are the toughest, strongest tractors ever built. Every part in each of the four models has ample size and strength to do its job — not a weak link nor a compromise anywhere.

And that's no accident! To bring you tractors like these . . . with the qualities you want . . . Allis-Chalmers built 'em completely new — from the ground up.

You can depend on them to take the loads, the jolts of today's jobs . . . because they are modern tractors designed for the most grueling operating conditions. They will more than measure up to your expectations!

Here are just a few of the many reasons why this  
**NEWEST, FINEST  
TRACTOR LINE ON  
EARTH is Built To**

*Take It* . . . besides being easy to operate, easy to service and outstanding in performance. Your Allis-Chalmers dealer will gladly explain all these advantages . . . see him NOW.

- All-Steel Welded Construction
- More Power with Bigger Engines — Longer Engine Life
- More Weight, Greater Strength
- Long-Lasting, Large Diameter Clutches

- Extra Heavy Main Frames — No Extra Reinforcement Needed for Front-Mounted Equipment
- Double Reduction, Straddle-Mounted Final Drive Gears with Live Sprocket Shafts and Caged Bearings
- Positive Operating Track Release —

- Works in Oil on HD-9, HD-15, HD-20
- All New, Specially Designed Track Assembly
- Positive-Seal Truck Wheels, Support Rollers and Idlers — Mounted on Tapered Roller Bearings. 1,000-Hour Lubrication!

# ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

*For Fast, High Capacity Loading*  
**Goodman** TRACTOR TREAD  
**LOADERS**



**SWINGING DISCHARGE END**

A 40° swing to either side for loading at angles without loss of time or capacity. Can also be raised or lowered to car height.

**FAST WORKING, HIGH CAPACITY**

Action of gathering arms and chains is smooth and continuous; coal moves from head to end in a steady flow. Powerful digging ability in tight coal, excellent clean-up.

**SAFETY FOR OPERATOR**

Operator stands well back from face at conveniently grouped controls. All movements of machine are within range of vision, and all are secured through quickly responsive hydraulic controls.

**SWINGING LOADING HEAD**

An exclusive Goodman feature that permits a 17 foot clean-up width with only forward and backward movement of the machine. Bottom is not torn up; posting can be close to the face.

Before you decide on any, see Goodman loaders and shuttle cars in action. Mine performance is the strongest evidence Goodman can offer of the ability of this equipment to produce high tonages. A Goodman sales engineer will be glad to arrange a mine visit.

**GOODMAN TRACTOR TREAD LOADERS**

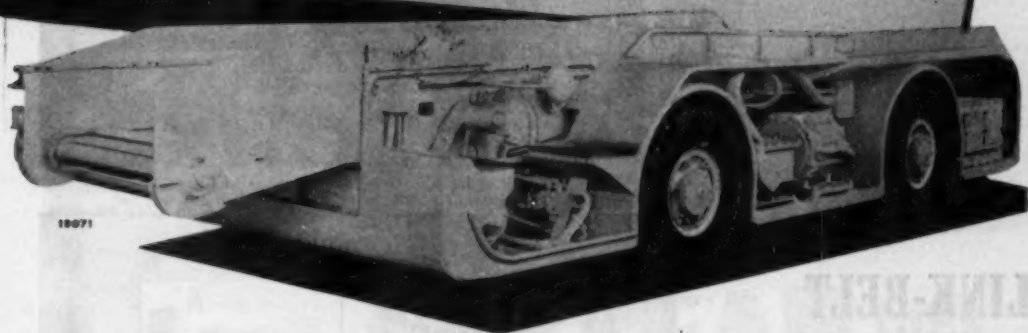
Type 665 - 43" over-all in height with adequate ground clearance for soft bottom. Suited for discharge into large shuttle cars.

Type 660 - 22" coal line height with an over-all height of 31½".

Type 660 - for very low coal. Its over-all height is 26½"; its coal line height only 17".

**Goodman**  
 HALSTED STREET

*For Fast, Reliable Transport*  
**Goodman**  
**SHUTTLE CARS**



18071

**EASY STEERING**

Four-wheel mechanical steering with a hydraulic booster. Little effort is required of the operator. Can be steered manually should power or hydraulic system fail.

**AUTOMATIC CABLE REEL**

Correct cable tension is maintained at all times, regardless of direction of travel. Reel is hydraulically driven and has an automatic spooling device.

**HYDRAULIC BRAKES**

Automotive truck type or airplane disc type brakes are available. Either may be locked to hold car on an incline. A supplementary emergency brake can be furnished.

**DRIVE**

Four-wheel, with controls on left- or right-hand side. Dual levers and switches permit operator to face in direction of car travel at all times.

*Goodman builds a complete line of cable reel shuttle cars in basic heights of 34" to 48" — with or without adjustable height discharge. On all cars, side boards can be added to increase capacities.*

**MANUFACTURING COMPANY**  
**AT 48TH • CHICAGO 9, ILLINOIS**

**LINK-BELT**  
engineering  
experience...

**Plus**

**LINK-BELT**  
quality  
components...

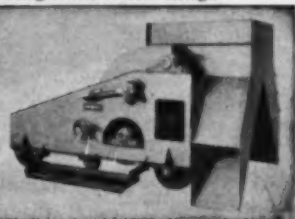
...add up to  
your best buy  
in **BELT**  
**CONVEYORS**



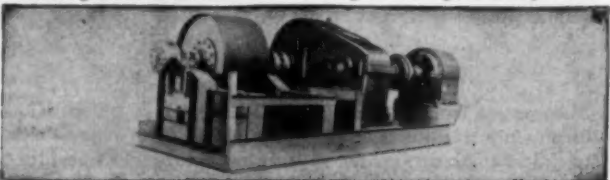
Link-Belt 48-inch-wide belt conveyor system handles 770 tons of coal per hour from ship unloading towers to dock storage.



Series 100 idlers are superior quality, with high-grade roller bearings and effective grease-in-dirt-out seal.



Link-Belt makes all types of trippers for discharging materials and distributing them along the conveyor belt.



Link-Belt power transmission equipment meets every conveyor need. Shown here: Link-Belt 300 H.P. fluid coupling drive and D-250 herringbone gear reducer.

Yes, you get *both*—practical engineering and quality components—when you call on Link-Belt for belt conveyors! Thousands agree Link-Belt makes the finest belt conveyors on the market today.

*Engineering experience?* Our conveyor specialists draw on an accumulation of years of materials handling and power transmission experience. They will help you and your consultants get top performance from a modern conveying system.

*Quality components?* We design every item on a belt conveyor system and build it to the highest standards. We make all types and sizes of idlers, take-ups, pulleys, trippers, bearings, drives and supports. You get the *right* equipment for your exact requirements when you rely on Link-Belt.

*See for yourself!* Let us show you some of the modern conveying systems we have installed. See the results of practical Link-Belt engineering experience—simplicity of design, the finest components, and most important, *top performance*.

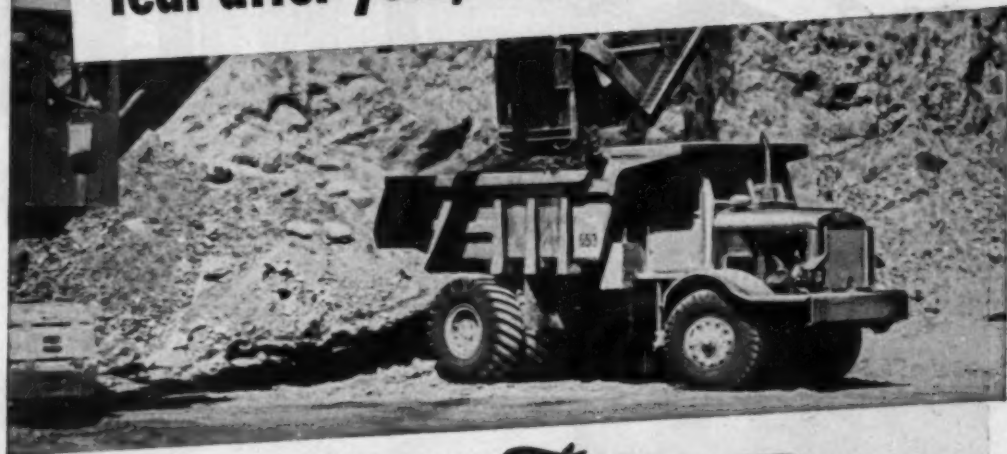
Remember, there's a Link-Belt conveying specialist in the branch office near you. Call him for complete engineering information.

**LINK-BELT**

**BELT CONVEYOR EQUIPMENT**

LINK-BELT COMPANY: Chicago 9, Philadelphia 40, Pittsburgh 13, Wilkes-Barre, Huntington 9, W. Va., Denver 2, Kansas City 8, Mo., Cleveland 15, Indianapolis 6, Detroit 4, St. Louis 1, Seattle 4, Toronto 8.

**Year after year, more tons are hauled**



**on GOOD YEAR tires**  
**than on any other kind!**

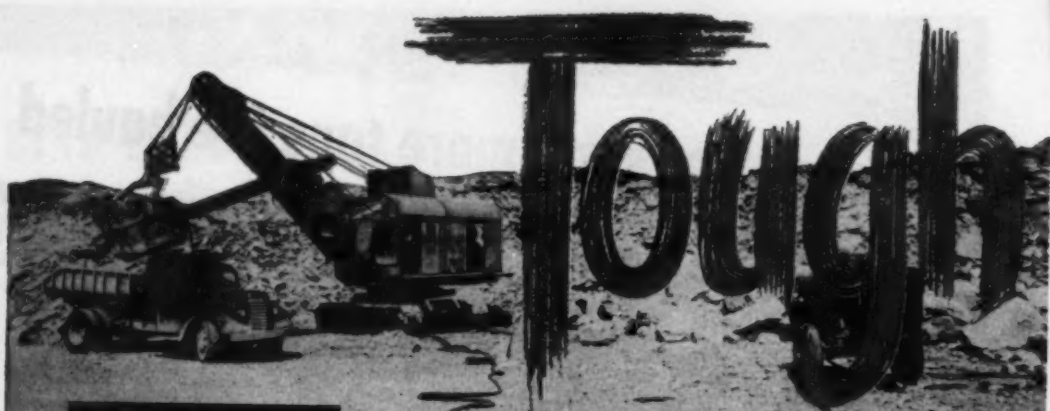


**ROAD LUG**

The dual-purpose tire for OFF  
and ON the road service

**HARD ROCK LUG**

Best for fire-bruising, heavy-  
duty off-the-road work



Strip Mining



Coal Loading



Dredging

# jobs all...

but they're easy for

## AMERCLAD\*

\*the heavy-duty electrical cable and cord

You'll find U-S-S Amerclad down in the mines, where it's relentlessly coiled and uncoiled and dragged over rails and ties. You'll find it on railroads for general utility use under all types of conditions.

You'll find Amerclad delivering power to the shovels in quarries and strip mines. There, it's reeled in and out all day long and hauled over sharp rock.

You'll find Amerclad under water, too . . . it's used on dredges that need electrical cable that can withstand great abuse. Actually, there's an Amerclad Cable or Cord for just about any tough operating condition you can name.

Amerclad Cable and Cord is jacketed with tough, resilient Amerprene. This quality jacket resists moisture, sunlight, mineral oil, grease, flame. It will not propagate fire. And it meets the requirements of ASTM D752.

Amerclad Cable and Cord can be furnished with PS Shielding,† the conducting rubber tape that prevents corona discharge because it will not pull away from the insulation like metallic shielding.

For more information, get in touch with your nearest American Steel & Wire Company office.

†PS Shielding—an original development of American Steel & Wire Company.

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COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS  
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS  
UNITED STATES STEEL EXPORT COMPANY, NEW YORK



## American Electrical Wire & Cable



UNITED STATES STEEL



# No body-hoist

## GRAVITY DUMP cuts maintenance costs... speeds haul cycles

Koehring Dumptors have no slow-working body hoists. Trip the release lever and gravity dumps the 6-yard load in one second. It's as simple as that! No complicated mechanical hoists to slow up haul cycles... no expensive replacement parts, costly hoist maintenance or down time to eat into your profits. And gravity dump is instantaneous and trouble-free in all temperature extremes... never wears out.

No costly spring maintenance is another

money-saving advantage you get with Koehring Dumptors. There is just one big, double-coil chassis spring on steering axle... none on driving axle. Extra-big, shock-absorbing drive tires eliminate need for more. You save spring maintenance time and replacement costs.

Check your body hoist and spring maintenance costs for a year... see how much you'll save by using Dumptors. What's more, Dumptor's no-turn shuttle haul and constant-mesh transmission for 3-speed travel forward and reverse, increases production... and your profits. See your Koehring distributor now for all the facts... or send today for informative 28-page Dumptor catalog.

**KOEHRING COMPANY, Milwaukee 16, Wis.**

(Subsidiaries) JOHNSON • PARSONS • KWI-MIX

4120

# KOEHRING



# DUMPTOR

CRANES UP TO 79½ TONS LIFT CAPACITIES... EXCAVATORS UP TO 2½ YARDS



### **SIMPLE BODY-RELEASE LEVER WORKS INSTANTANEOUSLY**

**1** Body release lever is located at steering wheel, no reaching or stretching. Lever engages trip rod on Dumper body...



**2** Trip rod instantly releases latch hooks from body latch seat on the Dumper chassis frame. Gravity dumps the load...




**3** Body rolls on heavy-duty rockers. Snub chains attached to big coil-spring shock-absorbers check body at 70-degree tilt.

# OLD KING COAL



...And here's how His



 King Coal's Preparedness Plan got a head start on N. Y. C.! Ever since 1945, New York Central has been ordering an average of 3,000 new coal cars a year. That's why it now has the extra coal-carrying capacity to meet the increased rearmament demands for coal in the steel, chemical and power industries.

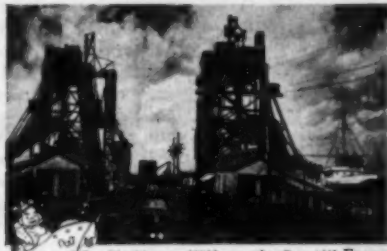
is a brave old soul.

"It's sad, but true," says he,  
"To be safe from harm, we must rearm—  
and that's a job for me!"

*Majesty travels to work via NEW YORK CENTRAL!*



The King is in the Crib, Too! New York Central has the largest fleet of coal-powered steam locomotives of any American railroad. That's why Central is not only hauling more coal . . . but buying vast quantities, too. About 9,000,000 tons in 1950, for which Central paid approximately \$42,000,000.



He Never "Misses the Boat"! From the mines of Kentucky, Ohio, Pennsylvania, Tennessee and West Virginia, New York Central trains speed coal to modern Great Lakes coal docks. At Ashtabula. At Oswego. And the newest and finest of all, at Toledo. Here floodlights for night operation . . . ship-to-shore radio for all-weather work . . . and latest-type electric coal loaders keep coal flowing without a hitch all through the navigation season.



King Coal's Rearmament Jobs are mainly in Central territory! The eleven states New York Central serves produce some 75% of America's iron and steel. A major part of the chemical industry is concentrated here. And since 1945, the growing demand for power in this key area has brought a one-third increase in coal-burning steam electric generating facilities.

NEW YORK CENTRAL COAL TRAFFIC DEPARTMENT

General Offices: 466 Lexington Avenue, New York 17, N. Y.

#### EXPERT HELP IN PLANNING SHIPMENTS OR DEVELOPING COAL PROPERTIES

The experienced aid of New York Central Coal Traffic Department is yours for the asking. Contact any of the representatives listed below.

H. L. WILLARD, Coal Traffic Manager, New York, N. Y.  
P. P. BELITZ, Coal Traffic Manager, Cleveland, Ohio  
R. K. HORTON, General Coal Freight Agent, New York, N. Y.  
F. P. SOEN, General Coal Freight Agent, Chicago, Ill.  
R. E. ROGERS, General Coal Freight Agent, Pittsburgh, Pa.  
A. W. BEHRENS, General Coal Freight Agent, Detroit, Mich.  
G. W. CHILDERS, Coal Freight Agent, Cincinnati, Ohio

# New York Central

The Smooth Water Level Route



# Use Either Bolt for Better Roof Control

To enable mine operators to obtain better, more secure roofs, Bethlehem furnishes the two types of mine roof bolts and accessories shown here: (left) square head roof bolt, with expansion sleeve, and (right) slotted roof bolt, with wedge.

Either combination minimizes the possibility of roof falls, and permits greater economies and more efficient mining by reducing the need for conventional roof support. Both bolts are made of new billet steel, and are furnished in virtually any length. They can be installed vertically, or at 45-deg or 60-deg angles, and are used in combination with plate washers, roof ties or channels. For use at either of the above angles, suitable angle washers are furnished. For additional information, write to us at Bethlehem, Pa.

## ← BETHLEHEM SQUARE HEAD ROOF BOLT WITH EXPANSION SLEEVE

This assembly consists of  $\frac{3}{4}$  in. bolt and expansion sleeve. Has special unchamfered square head for greater wrenching surface. Forged washer under head for additional bearing surface.

When assembled, bolt is engaged by a forged-steel tapered plug. When bolt is tightened, the flat surfaces of plug provide full contact with rough-surfaced prongs of expansion shell to fill the hole.

## BETHLEHEM SLOTTED ROOF BOLT →

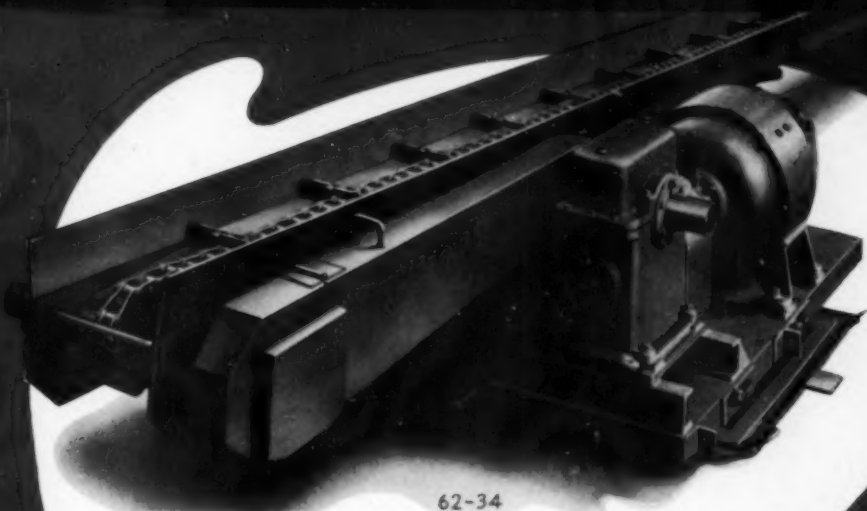
As its name implies, one end of bolt is slotted for 6 in. to accommodate wedge. Other end has 5 in. of 1-in. rolled thread. Generally furnished with regular square nut. When back of hole is reached, wedge is forced deeper into slot, expanding end of bolt to provide tight fit.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



## BETHLEHEM MINE ROOF BOLTS



62-34

# JEFFREY CONVEYORS

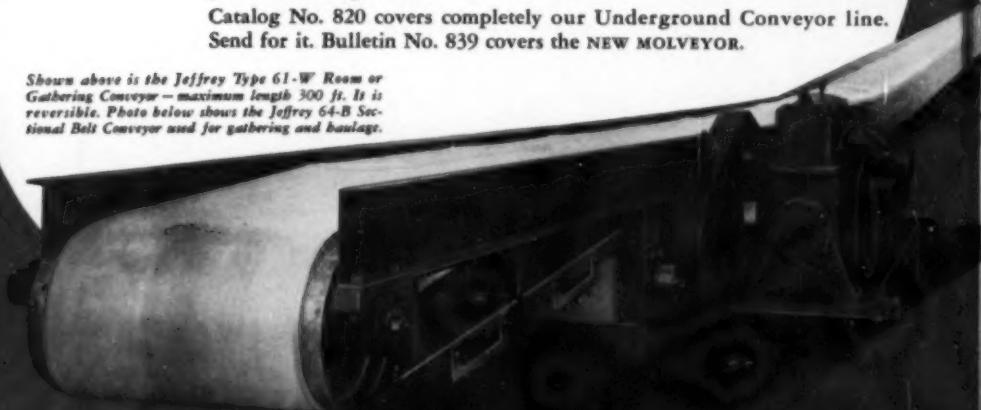
Face, room and entry types to meet the requirements of both Bituminous and Anthracite mining . . . as well as Sectional Belt Conveyors for transporting coal from continuous mining machines.

Our Engineers are always available to help you select the proper type of equipment for a complete set-up of Conveyor Mining and to meet specific conditions.

Jeffrey's long experience in designing, developing and building mine equipment and our complete modern manufacturing facilities offer you not only top-quality equipment but freedom from excessive maintenance plus low-cost operation.

Catalog No. 820 covers completely our Underground Conveyor line. Send for it. Bulletin No. 839 covers the NEW MOLVEYOR.

*Shown above is the Jeffrey Type 61-W Room or Gathering Conveyor — maximum length 300 ft. It is reversible. Photo below shows the Jeffrey 64-B Sectional Belt Conveyor used for gathering and haulage.*



*Jeffrey Type 61-MD Pann Conveyor loading coal to a Jeffrey 61-AM Beam Conveyor. These units are sufficiently sturdy to meet the requirements, yet light enough to be easily and quickly moved.*

**WHEREVER COAL IS MINED YOU**

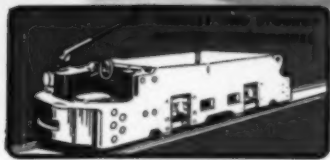
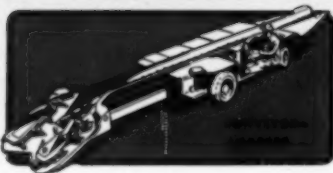


*Another example of the Pann and Beam Conveyors in operation. This unit is giving depth and depth setting in many mines where efficiency and economy are in demand.*

Here we have a Jeffrey Shuttle Conveyor carrying coal  
to the Entry Rail Conveyor which hauls it over long  
distances beyond the Belt of the Chain Conveyor.

## YOU'LL FIND JEFFREY EQUIPMENT

See another picture of how Jeffrey goes underground  
and provides maintenance operation by both cutting the  
road and getting it cleaned out. A Free and Trench Conveyor  
as well as a Jeffrey Shovel Coal Loader are shown.



# JEFFREY

## EQUIPMENT

## FOR COAL MINES

### THE JEFFREY MANUFACTURING COMPANY

Established 1877

General and Export Sales Offices

COLUMBUS 16, OHIO, U. S. A.

#### DISTRICT SALES OFFICES

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Baltimore Bldg.  
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2210 Third Ave., N.  
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38 Newbury Street  
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HOUSTON 2, TEXAS  
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NEW YORK 7,  
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Broad St. Station Bldg.  
PITTSBURGH 22,  
Oliver Bldg.  
SALT LAKE CITY 1,  
101 W. 2nd South St.  
ST. LOUIS 1,  
Railway Exchange Bldg.  
SCRANTON 3,  
122 Adams Avenue

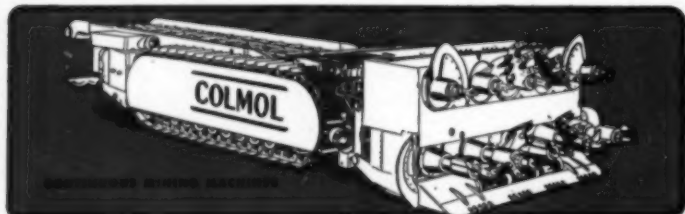
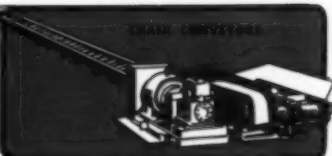
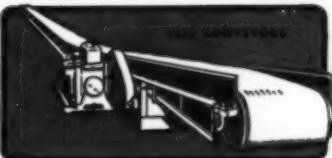
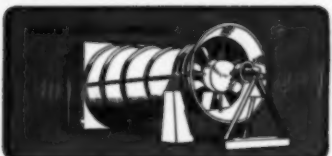
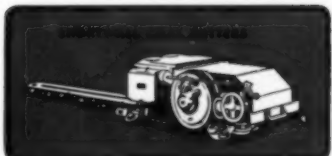
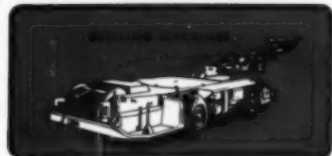
#### SERVICE STATIONS

BIRMINGHAM • PITTSBURGH • JOHNSTOWN • SCRANTON • MT. VERNON, ILL. • HARLAN, KY.  
In West Virginia: BECKLEY — CABIN CREEK — LOGAN — MORGANTOWN — WELCH

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THE OHIO MALLEABLE IRON CO., Columbus, Ohio

BRITISH JEFFREY-DIAMOND LTD., Wakefield, England  
THE GALION IRON WORKS & MFG. CO., Galion, Ohio  
THE KILBOURNE & JACOBS MFG. CO., Columbus, Ohio



# PROFITABLE FRANCHISES AVAILABLE

**... for the distribution of disposable rock bits**

## THE PRODUCTS

- one-pass rock bits, so inexpensive they're thrown away instead of resharpened.
- bit sizes from  
1 1/4" to 1 3/4" with 3/8" dia. sockets  
1 1/2" to 2 1/8" with 1" dia. sockets  
1 3/4" to 2 3/4" with 1 1/4" dia. sockets

## THE USER ADVANTAGES

- faster drilling, easier drill-steel preparation
- lower cost per foot of hole
- longer bit life, longer drill-steel life
- smooth, clean holes—less dust fines
- elimination of bit sharpening
- reduces drill bit inventory, and overall cost of drill-steel
- elimination of upsetting on drill-steel increases space for chip removal and minimizes stuck steel in hole

## THE USES

- drilling roof-suspension bolt-holes in coal mines
- quarrying
- open-pit mining
- metal mining
- non-metal mining
- multiple (wagon) drilling
- road-building; heavy construction

## THE MANUFACTURER

- disposable rock bits are made in a new plant fully equipped with modern production machinery. This plant is located near Pittsburgh where raw materials are readily available and transportation facilities will permit quick shipment of rock bits by the keg or the carload.

## THE DISTRIBUTOR FRANCHISES

1. Profitable exclusive franchises are available to distributors serving the coal mining, quarrying, metal and non-metal mining industries, road-building and heavy construction fields.
2. These franchises will cover rock bits, drill rods, and bit knock-off tools.
3. The manufacturer will furnish full support with—
  - advertising
  - promotion
  - bulletins
  - exhibits
  - publicity
  - direct-mail
4. Write, wire or phone for full details on territories and exclusive franchise arrangements to Mr. William B. Knepschild.

## DRILL BIT AND TOOL COMPANY

NINTH & BINGHAM STREETS, PITTSBURGH 3, PA.

MAKERS OF THE **THROWAWAY** BIT

# New river-loading plant cleans 800 tph of coal with help of G-E drives!

<sup>1</sup> At the rate of 800 tons per hour, Truax-Truax's central Cerado plant prepares high-grade metallurgical and steam coal from the company's mines as far as 80 miles away. Completed in January 1950,

it utilizes a unique barge-loading plant with retractable belt conveyor (shown at left) which permits automatic loading of barges regardless of wide fluctuations in river level.



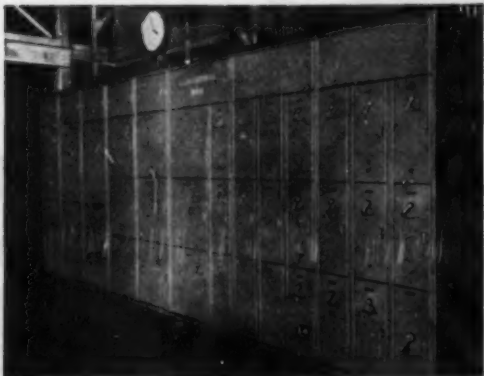
GENERAL  ELECTRIC

605-18

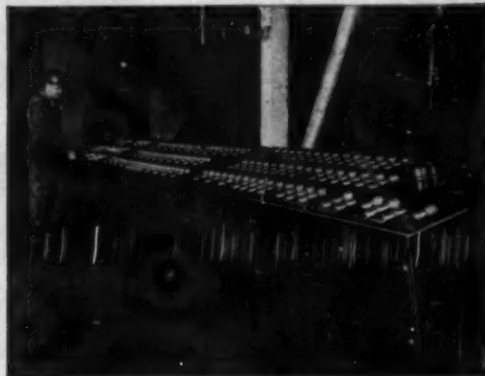
**Truax-Traer Coal Company's Ceredo, W. Va., preparation plant—loading automatically to both river and rail—relies on General Electric motors and control for stay-on-the-job dependability**



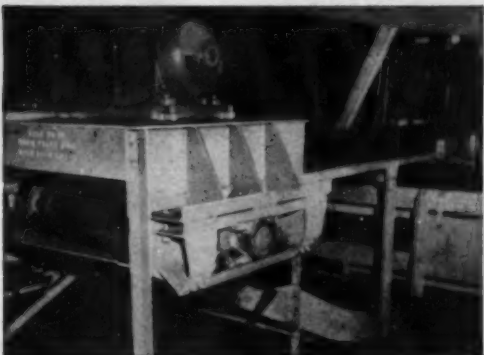
**2** Flow of coal through the plant is maintained by electrified equipment driven largely by G-E motors, which account for almost all the plant's connected 4858 hp. Here are two of five G-E Tri-Clad® open (drip-proof) 125-hp motors driving recirculating pumps that supply launders and wash boxes.



**3** Centralized control for groups of motors in various sections of the plant is provided by eight G-E Cabinetrol® assemblies (one shown). These units, metal-enclosed for personnel protection and individual circuit isolation, come ready for quick installation.



**4** More efficient use of manpower is made possible at the Ceredo plant by the use of this master control desk. It combines all 82 G-E push buttons and indicating lights in one location, thereby closely coordinating plant operations with minimum effort.



**5** From rotary dumps to loading booms, plant's equipment is kept "on the go" by G-E Tri-Clad motors—triple protected against physical damage, electrical breakdown, and operating wear and tear. This Tri-Clad motor drives one of five rail loading boom conveyors.

\* Registered trade mark of General Electric Co.

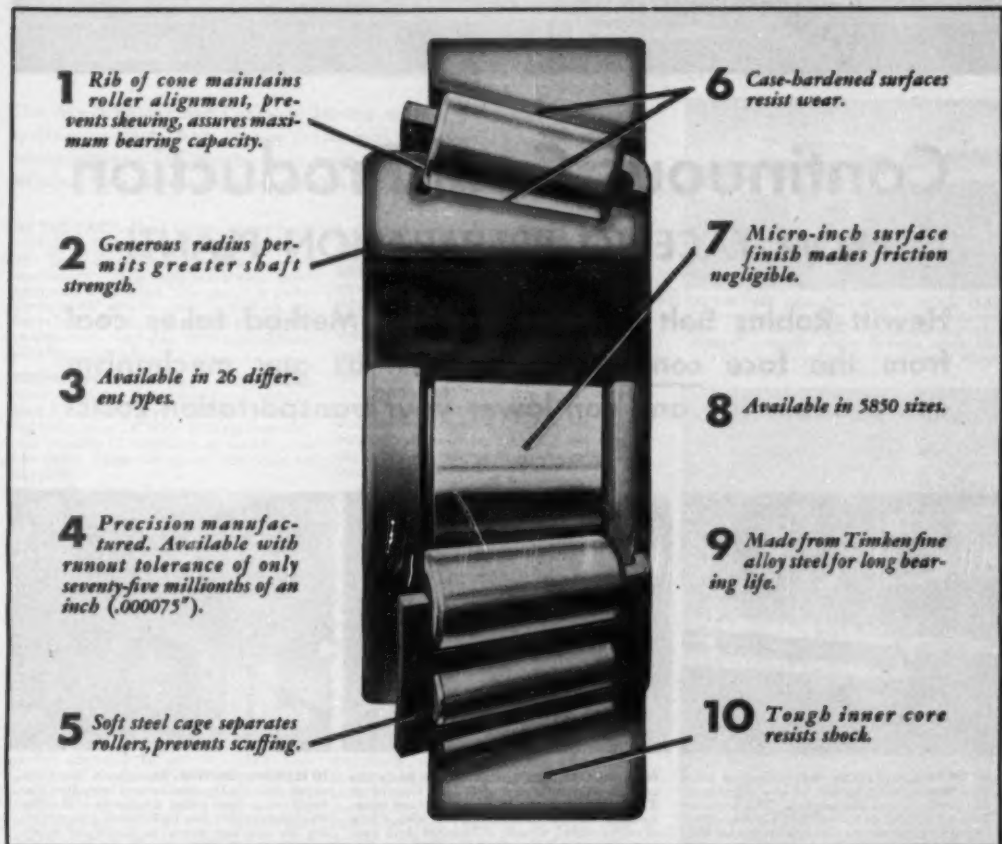


**DRIVES**  
for  
**COAL PREPARATION PLANTS**  
—to cut clean-coal costs!

**6** "Electrified coal preparation," a 32-page photo-report, shows how modern coal preparation plants are applying electrified machinery to increase clean-coal output, reduce coal-processing costs. Ask your G-E representative about it, or write for Bulletin GEA-5308. General Electric Company, Schenectady 5, N. Y.



# 10 reasons why your best bet in bearings is TIMKEN®



**O**THER tapered roller bearings may look like Timken® bearings. But there is no other tapered roller bearing which gives you as many important advantages as you get with Timken.

Ten of these advantages are listed above. They all stem from the fact that the Timken Company is the foremost producer of tapered roller bearings and leads in (1) advanced design, (2) precision manufacture, (3) rigid quality control, (4) special analysis steels.

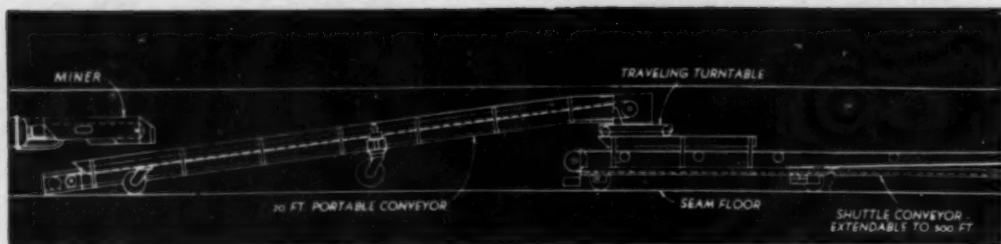
Be sure that every tapered roller bearing you use carries the name "Timken", the trade-mark of The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

**TIMKEN**  
TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

COAL AGE • July, 1951



## Continuous Coal Production FROM FACE TO PREPARATION PLANT!

Hewitt-Robins Belt Conveyor Mining Method takes coal from the face continuously as fast as any mechanism can produce it...and can lower your transportation costs!



**AT THE FACE,** a portable Belt Conveyor takes coal continuously as fast as any machinery can produce and discharge it. The unit can be used in coal as low as 30°. Rubber-tired, free-swinging casters make the portable easy to move and handle.



**FROM THE FACE,** the portable unit feeds the coal directly onto a shuttle Belt Conveyor. The latter consists of 8' pin-connected intermediate sections, each equipped with a pair of rubber-tired wheels. A covered deck protects the return strand of the Belt.



**TO TRANSFER CONVEYOR.** The shuttle Belt Conveyor delivers the coal onto a transfer Conveyor at a fixed-point discharge unit. The discharge pulley can be lowered when moving to another room or entry or when advancing the unit.



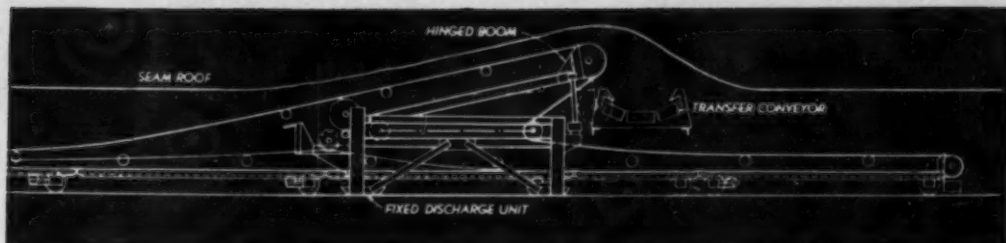
**TO PANEL-ENTRY CONVEYOR.** The transfer Conveyor feeds the coal onto a panel-entry Mine Conveyor. The latter is assembled with 8' or 10' intermediate sections of 26", 30" or 36" width or wider. Sections are made for drop-in assembly; easily installed and extended.



**TO MAIN HAULAGE CONVEYOR.** The panel-entry Conveyor discharges the coal onto a main line Belt Conveyor system which consists of multiple tandem units assembled from 12' rigid intermediate sections. Such systems provide haulage from 500' to 5000'.



**INTO PREPARATION PLANT.** The coal is delivered from the main haulage system onto a slope Belt Conveyor (inclined or declined) for transfer into the preparation plant. From start to finish, coal transportation is continuous, fast, economical.



This schematic drawing indicates how coal moves continuously from face to transfer point.

The Hewitt-Robins Belt Conveyor Mining Method gives you genuinely continuous output—from face to preparation plant—and can lower your transportation costs. Whether your seam is 30" or 42" or higher, coal can be taken from the face continuously as fast as any mechanism can produce it.

**AT THE FACE.** Here the compact portable Belt Conveyor handles coal on a 24" Belt directly from any loading machinery. It is independently powered and controlled. The portable swivels in a 45° arc to right or left on the traveling carriage mounted on its discharge end—and also advances as face-cutting progresses.

**FROM THE FACE.** The portable feeds directly onto a rubber-tired shuttle Belt Conveyor, an extendable traversing unit using 24" wide Belt (minimum) and capable of handling up to 250 tons per hour. Lengths up to 500' can be supplied.

The shuttle Belt Conveyor is moved forward with the face by a rope haul. It receives coal from the portable or directly from the miner. Delivery to a transfer Conveyor is by means of a fixed-point discharge unit. The discharge at this fixed point can be adjusted for height to assure proper transfer of coal. It can also be lowered when transporting the unit from one room or entry to another in 30° or 40° coal—as well as for advancing in the entry being worked, without taking roof or bottom.

As long as coal is up ahead to be removed, the shuttle Belt Conveyor moves forward to get it, while the stationary discharge unit keeps transferring it. As the working end of the Conveyor advances in-by toward the face, the storage conveyor length extended out-by at the fixed-point discharge unit is utilized to keep pace with progress at the face. Extra storage length for an entire working shift can

be assembled and installed with no interruption in output.

**FROM TRANSFER POINT.** Coal can be moved continuously to the foot of the slope by Hewitt-Robins standard panel-entry Mine Conveyor or other transverse Conveyor medium.

**INTO PREPARATION PLANT.** To assure continuous coal delivery—at low transportation cost—the panel-entry Mine Conveyor delivers to a Hewitt-Robins main haulage Belt Conveyor, then transfers it to a slope Belt Conveyor for movement into the preparation plant.

**GET COAL CONTINUOUSLY . . .** from face to the plant—at low cost. Use the Hewitt-Robins Belt Conveyor mining method. Hewitt-Robins Mine Conveyors are sold as standard package-units. Both Troughing and Return Idlers are adjustable for Belt training, have anti-friction bearings and the Hewitt-Robins one-shot lubrication feature. Lagged pulleys assure maximum power transmission.

Only Hewitt-Robins manufactures both machinery and belt. Only Hewitt-Robins can provide—from within its own corporate structure—every element of successful Belt Conveyor performance . . . from designing and engineering through manufacture and erection. Write for Bulletin No. 153 containing details of the Hewitt-Robins Belt Conveyor mining method. Address: Hewitt-Robins Incorporated, 1010 Pennsylvania Ave., Charleston, W. Va., or 270 Passaic Ave., Passaic, New Jersey.



THE PORTABLE rises clear of the shuttle Belt Conveyor and swivels on its own discharge end. A pair of vertically-adjustable auxiliary casters, normally above bottom while the portable is in operation, are lowered when the unit is moved separately.



THE SHUTTLE BELT CONVEYOR traverses backward and forward on rubber-tired, anti-friction bearing wheels. Flanged wheels can be supplied for use on prefabricated light track. Idlers for return strand of Belt are dropped in easily. Note rope-haul anchor.



VERTICAL GUIDE PULLEYS, equipped with anti-friction bearings and mounted on standard roof jacks, are installed with staggered spacing of approximately 30' to maintain accurate alignment of the Belt when rubber-tired casters are used.



THE FIXED-POINT DISCHARGE UNIT of the shuttle Belt Conveyor is equipped with all operating and traversing controls as well as Takeup. Push-button control is also provided adjacent to the miner. Complete control of all operations is doubly positioned for top efficiency.

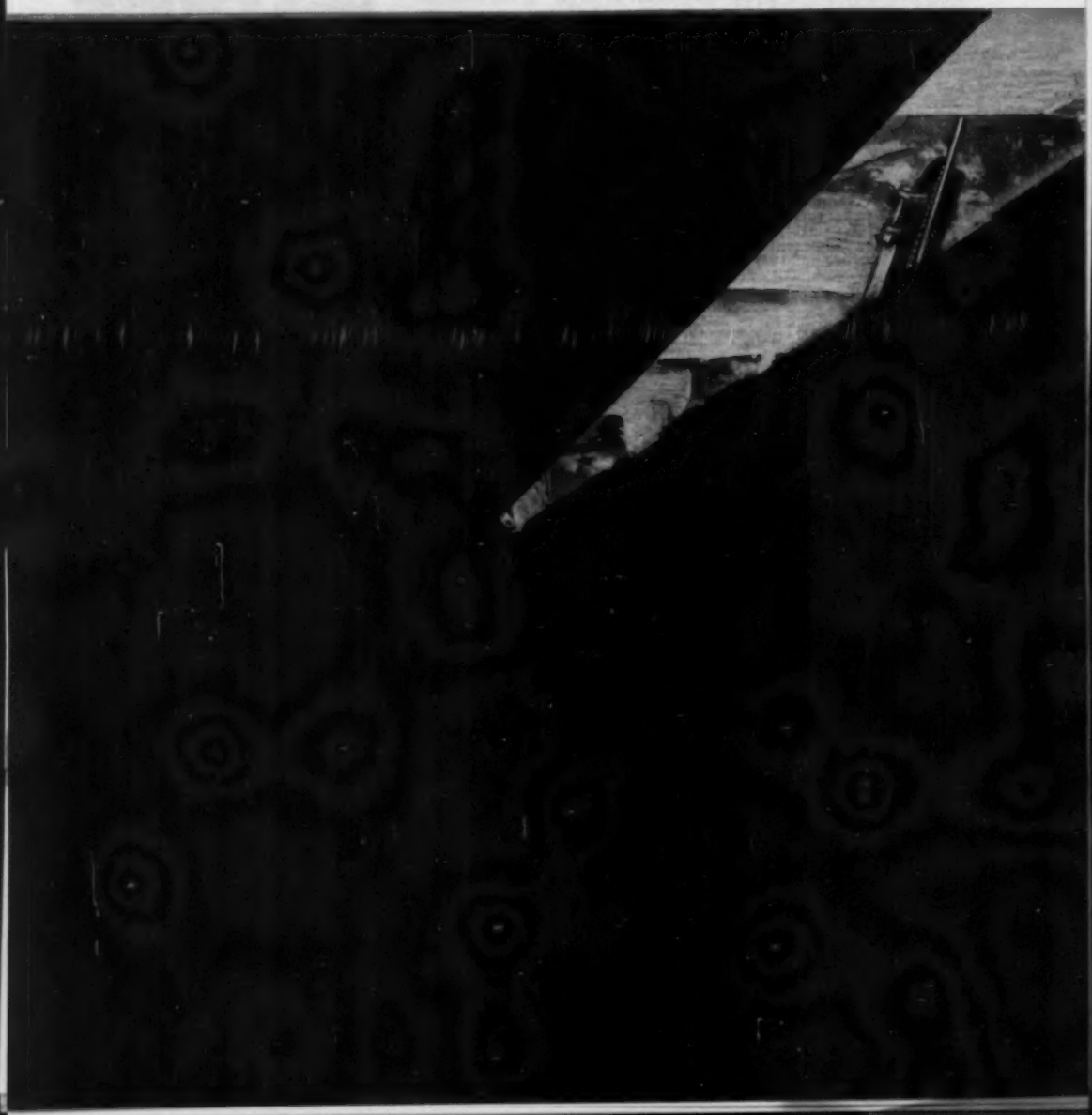
Hewitt-Robins is participating in the management and financing of Kentucky Synthetic Rubber Corporation.

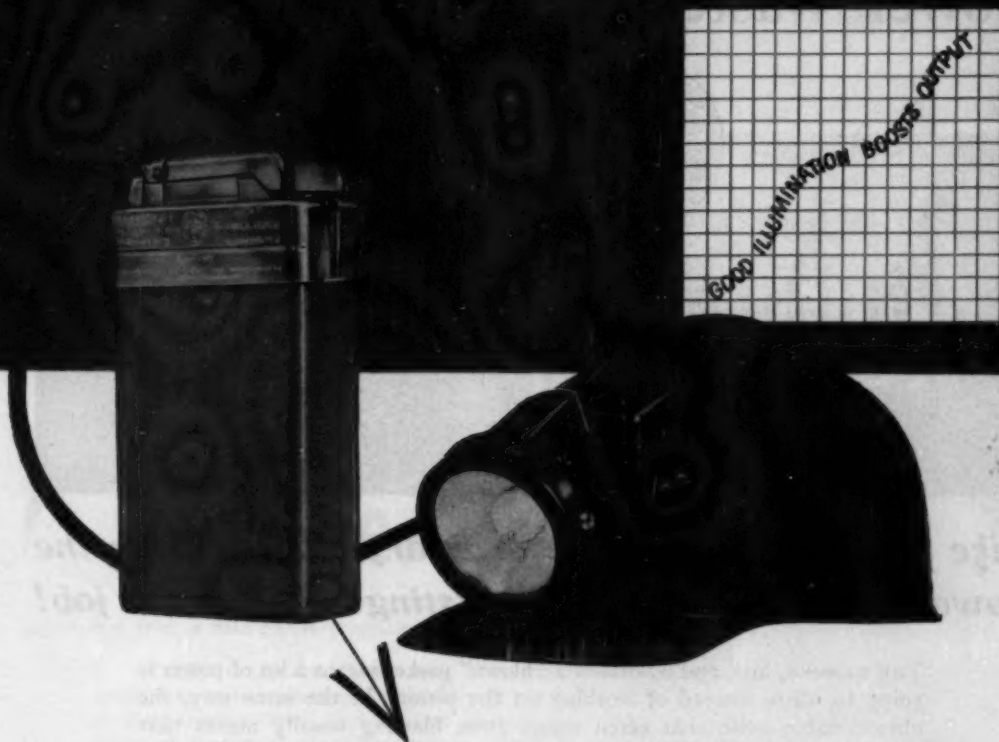
## HEWITT-ROBINS MINE CONVEYORS

HEWITT-ROBINS  INCORPORATED

BELT CONVEYORS (belting and machinery) • BELT AND BUCKET ELEVATORS • CAR SHAKEOUTS • DEWATERIZERS  
FEEDERS • FOAM RUBBER PRODUCTS • POUNDRY SHAKEOUTS • INDUSTRIAL HOSE • MINE CONVEYORS  
MOLDED RUBBER GOODS • RUBBERLOK ROTARY WIRE BRUSHES • SCREEN CLOTH • SKIP HOISTS  
STACKERS • TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS

*Extra ILLUMINATION  
for  
MECHANIZATION*





## WITH THE M.S.A. EDISON MODEL R-4 ELECTRIC CAP LAMP

Every step forward in mechanized mining calls for something extra in illumination. Keeping ahead of this ever-increasing need for effective lighting is essential to the miner's safety and the mine's production. You'll find a dependable and profitable solution in the Edison R-4 Lamp. Its brilliant, unfailing light is designed to fill your lighting needs today, with an extra margin of performance to meet any expanded requirements of tomorrow. Providing *more* and *better* light, the R-4 keeps the men in step with advancing mechanization.

This vital mining tool pays off in greater safety and higher production too. Its brilliant

beam illuminates every detail of the job, exposes lurking hazards, encourages greater tonnage output. Its design and construction keeps it on the job, shift-after-shift, month-after-month, for years.

And you'll find the R-4 gives an extra bonus in service requirements—it requires less handling, fewer man-hours to maintain, and is quick and simple to service.

Write for Bulletin No. M-19 for complete details, or let us arrange an actual demonstration in your particular mining operation at your convenience.

### MINE SAFETY APPLIANCES COMPANY

BRADDOCK, THOMAS AND MEADE STS.  
PITTSBURGH 8, PA.

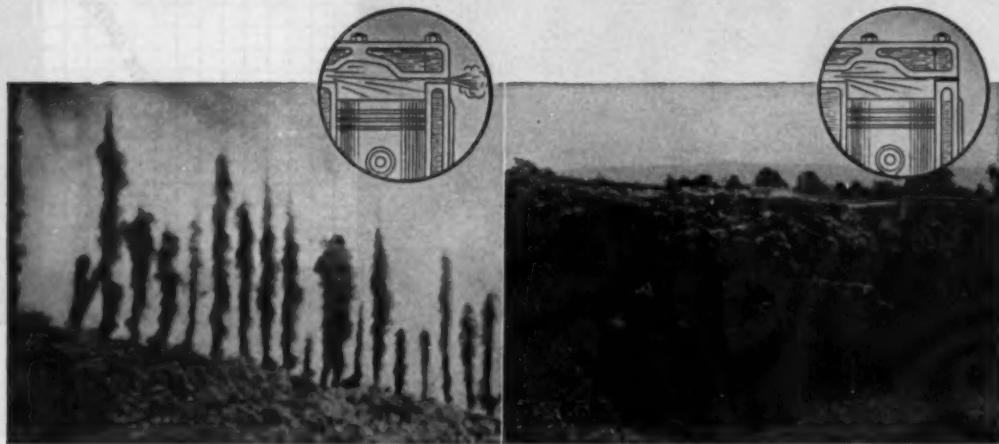
At Your Service

54 BRANCH OFFICES IN THE UNITED STATES AND CANADA

When you have a safety problem, M.S.A.  
is at your service. Our job is to help you.



# Power Wasted!      Power Working!



*Like a "blown" gasket, an ordinary blast wastes the power that **ROCKMASTER** blasting keeps on the job!*

THE HAMMER, hiss, and whistle of a "blown" gasket means a lot of power is going to waste instead of working on the piston. In the same way, the objectionable noise that often comes from blasting usually means that explosives power is being wasted instead of working on the rock. And that wasted gas is often visible as "geysers" of smoke or wild flying rock.

ROCKMASTER blasting keeps blasting power—the explosives gas—well confined and working on the rock. ROCKMASTER blasting gives a smooth flow of power that means control over breakage and throw never before possible—with far less noise and vibration!

Your job may call for two, three, or even all sixteen ROCKMASTER milli-second delay electric blasting caps. We help you select them to fit a particular job in quarry, strip pit, mine, construction . . . on the surface or underground. Drill pattern is adjusted to fit the system, often with substantial savings in drilling and dynamite.

Write for free ROCKMASTER "16" booklet which includes diagrams for typical loadings. And remember that our technicians will be glad to assist you in applying ROCKMASTER to your operations.

ROCKMASTER: Reg. U. S. Pat. Off.

# ATLAS

EXPLOSIVES  
"Everything for Blasting"



ATLAS POWDER COMPANY, Wilmington, Del. • Offices in principal cities • Cable Address—Atpowco



## NEITHER SURF, NOR ROCKS, NOR BARNACLES....

This "beat-up" looking piece of TIREX Cord is a veteran of many battles with the sea. Here's an excerpt from a field report describing its performance.

"TIREX Cords and Cables have been found to be the only product that can be counted upon to withstand consistently the severe abuse to which they subject cables in their research work. One instance was given: A TIREX Cord led from a heavy instrument located on the ocean bottom several hundred yards from the shore, through the surf and over a rocky water line to the point where they were taking readings. After an unexpected storm they found this heavy instrument cast far up on the beach with the cord still attached, but in a tangled mass. The instrument was a total loss but the cord was intact and was used again on many subsequent occasions without requiring repair."

Isn't that the kind of service you want from your portable cords and cables? Of course it is! You can be sure to get it if you specify and be sure you get Simplex-TIREX Cords and Cables. They're a product of Simplex Research.

Simplex Research gave you the first heavy duty, rubber-jacketed portable cord or cable; the first low water absorption insulation; the first rubber-jacketed underground cable. Besides these notable "Firsts" Simplex Research has provided a great many developments which have enriched the art of cable design.

*TIREX is not made nor recommended to be used under water. However, the spectacular life of this TIREX Cord illustrates perfectly the inherent ruggedness of TIREX. This ruggedness has been deliberately built into all TIREX Cords and Cables. It is one of the "plus values" that you get when you use TIREX.*

---

SIMPLEX-TIREX IS A PRODUCT OF SIMPLEX RESEARCH

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# SIMPLEX-TIREX

SIMPLEX WIRE & CABLE CO. 79 SIDNEY ST. CAMBRIDGE 39, MASS.



**BEFORE**—Cutting machine in large Virginia coal mine with Johnson-March spray turned off for only one minute. Compare this photo with the one at the right.



**AFTER**—This is the same operation with the Johnson-March system eliminating dust. These systems have proved themselves in hundreds of mines. We'll be glad to furnish names.

# STOP COAL DUST

for 1/2 cent a ton

**...70% to 80% more effective than plain water!**

A Johnson-March liquid diffusion system will control coal dust wherever it occurs—at the cutting face on mining machines, loaders and continuous miners; at dumps, or at the tippie. It keeps dust from rising and mixing with the air. This eliminates the dust explosion hazard, protects your property, and promotes the health and safety of your employees.

Tests by the Bureau of Mines have shown that Johnson-March compounds added to water are 70% to 80% more effective in dust control than water alone... and the cost is only 1/2 cent a ton.

Without cost or obligation, why not have one of our engineers discuss your dust problems with you? Just drop us a line or mail the attached coupon.

THE JOHNSON-MARCH CORP.  
1724 Chestnut St., Philadelphia 3, Pa.  
Without cost or obligation, I would like to know more about the Johnson-March system of low-cost dust control. C-2

Name.....

Company.....

Address.....

City.....

State.....

## Johnson March

Specialists in Liquid Diffusion

1724 CHESTNUT STREET

Philadelphia 3, Pa.

## You get practical help on lubrication and maintenance problems

-when the GULF LUBRICATION ENGINEER  
is "in the picture"



One of the best sources of help on any mining machine problem that involves lubricants or lubrication is a trained Gulf Lubrication Engineer.

Gulf Lubrication Engineers are experts in petroleum technology—they are familiar with refining processes, properties, and the past performance records of various types of lubricants. They completely understand the effect of different operating conditions on lubricants. And, just as important, they know the lubrication requirements of all types of mining machines. The application of this knowledge and experience to each individual problem helps reduce maintenance costs and improve performance.

To get the benefits of this expert engineering service for your equipment, call in a Gulf Lubri-

cation Engineer today. Write, wire, or phone your nearest Gulf office. Also ask for a copy of the booklet, "Gulf Periodic Consultation Service," which tells about Gulf's advanced cooperative service for users of petroleum products.

**Gulf Oil Corporation • Gulf Refining Company**  
GULF BUILDING, PITTSBURGH, PA.



# Service-Proved... the NOLAN Porta-Feeder



**FOR QUICKLY  
AND  
ECONOMICALLY  
SPOTTING  
CARS FOR  
LOADING...**

**I**NVESTIGATE the Nolan Porta-Feeder for ease of installation, economy of operation, ruggedness and safety in your mine car-spotting equipment!

The Porta-Feeder mounts between the rails on top of the track ties, secured by jacks that permit quick movability. Little or no excavation or preliminary foundation work is necessary. The drive is on skids and is connected to the gear head by a strong universal joint and propeller shaft assembly. A sealed drive head allows operation in water up to the base of the rails. Reciprocating pushing dogs deliver constant forward feeding motion.

Because of its comparatively light weight, and freedom from need of expensive, permanent-type anchorage, the Nolan Porta-Feeder can be quickly moved as necessary, without excessive loss of time or production. No ropes or cables are used in the Porta-Feeder. High efficiency is attained through the short-shaft delivery of power and uninterrupted forward flow of action. Extreme ruggedness of construction assures long service life.

*Actual mine service has proved the high efficiency of the Nolan Porta-Feeder—write for full details.*



A close-up view of the heavy, rugged propeller shaft and universal joint in the NOLAN Porta-Feeder drive.



Note the strong, massive construction of the NOLAN Porta-Feeder feeding mechanism, and its position on top of the track ties.



All controls are contained in an efficiently-designed, dust-tight, handy box mounted on drive skid base with motor.

MODEL	H. P.	DRAW BAR PULL	SPEED	WEIGHT
NLSN	5	6000	25 F. P. M.	6300
NL7N	7½	9000	25 F. P. M.	6700
NL10N	10	9000	35 F. P. M.	6920
NL15N	15	12000	35 F. P. M.	7295

**THE NOLAN COMPANY BOWERSTON, OHIO**



Not this...



The start of a new mining program...

# Roof Bolting

## is Easier and Faster

**IN** mine after mine, roof bolting helps increase production — raises tons per man-shift.

As the trend toward this new practice grows, more and more Le Roi-CLEVELAND "short-leg" stopers are going underground. For example, in one leading coal-mining area 91 out of 103 mines use Le Roi-CLEVELAND.

Here are a few reasons why these time- and money-saving machines can keep your roof-bolting cost down:

★ A complete range of sizes to meet every mining condition including low coal.

★ Easy handling and fast drillers.

★ Trip rotation — this is standard on all Le Roi-CLEVELAND machines so that you can use the same stopper for drilling and, by stopping the rotation, for driving roof bolts.

★ Built to stay underground — that's why you can depend on LeRoi-CLEVELAND stopers to save time and cut costs.

If you want more information on roof bolting just drop us a line. We pioneered and perfected not only the roof-bolting stopper, but also many of the techniques in use today.

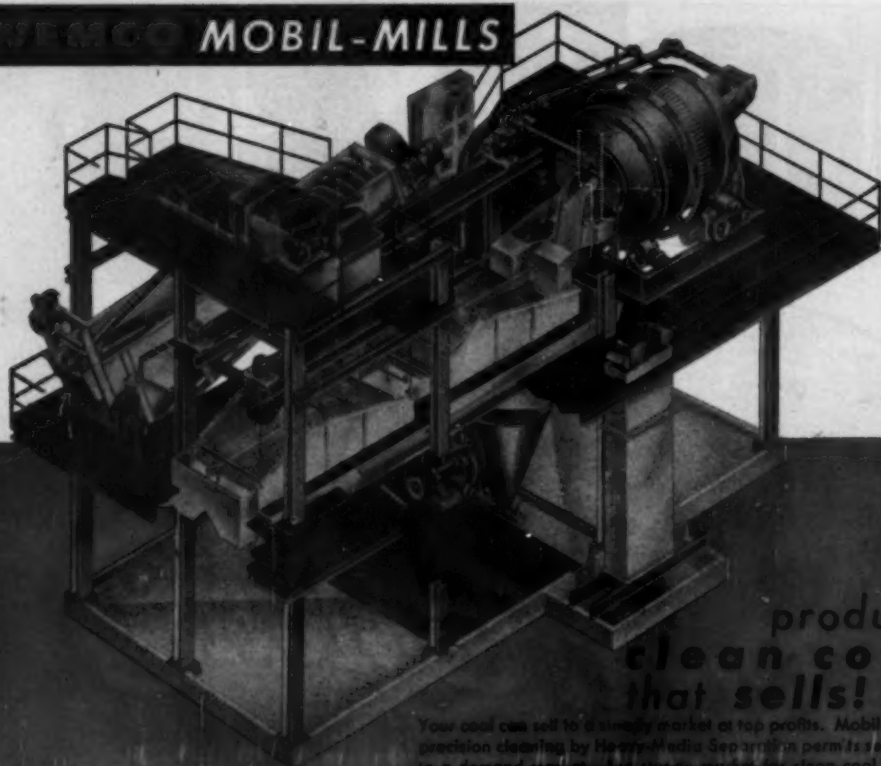


# LE ROI COMPANY

CLEVELAND ROCK DRILL DIVISION

12500 Baren Road, Cleveland 11, Ohio

# WEMCO MOBIL-MILLS



produce  
clean coal  
that sells!

7

REASONS WHY WEMCO MOBIL-MILLS HAVE OUTSOLD ALL OTHER HEAVY-MEDIA SEPARATION PLANTS COMBINED:

- Prefabricated
- Low initial cost
- Fast installation
- Compact design
- Low operating cost
- Clean, sharp separation
- Installed for you

WRITE TODAY for new bulletins giving complete information on how a Mobil-Mill can greatly improve the price and saleability of your coal.

#### PRINCIPAL OFFICES

San Francisco • Sacramento • Salt Lake City • Spokane  
Portland, Idaho • Denver • Phoenix • Chicago  
Minneapolis • Kansas, Florida • New York

#### EXPORT DISTRIBUTORS

• The Ore and Chemical Corporation  
80 Broad Street • New York 4, N.Y.

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Dr. Ing. Herbert Lohde, A.G. Dreydahn 1, Bremen  
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G. Bultmann & Co., Athens, Greece  
Agence Miniere & Industrielle, S. A., Antwerp, Belgium  
J.B. Schuyt & Albert Spaeyls, Leuven, Belgium

• Power & Chemical, (S.A.) Ltd. Johannesburg, South Africa  
• Johnston & Co., Inc., Seattle, Washington

Your coal can sell to a ready market at top profits. Mobil-Mill precision cleaning by Heavy-Media Separation permits selling to a demand market—the steady market for clean coal. Of many operators who have installed Wemco Mobil-Mills to swing sales upward and change losses to profits, an Illinois coal producer is a typical case.

Nearly out of business because of a rapidly diminishing demand for unwashed coal, this Illinois operator installed a #3C Wemco Mobil-Mill to wash approximately 60 TPH of 4" x 1/2" coal. Results were impressive. 91% of his total feed was recovered as readily saleable clean coal with ash content reduced from 13% to 9.1% (6% inherent ash). 99.15% of the Mobil-Mill washed coal reported as true float (by heavy liquid test), and media consumption was only 0.67 lbs. per ton of H.M.S. feed. As a result, this operator now produces a product which more than meets his market demands.

Wemco Mobil-Mills fit your requirements. All coal to 8" can be washed. Capacities range from 25 to 350 TPH with a choice of equipment to suit your application.

# WEMCO

WESTERN MINING COMPANY

780 788 FOLSOM STREET • SAN FRANCISCO 7, CALIFORNIA

#### MOBIL-MILLS

COAL SPIRALS

WMS THICKENERS

WMS PUMPS

DEWASERS

COKE SEPARATORS

FLUID SEPARATORS

#### FARMER & STEPHENSON

FLotation MACHINES

FARMER LABORATORY

UNITS

HYDROSEPARATORS

WMS LABORATORY

#### DEWATERING

SPIRALS

AGITATORS

S-M CLASSIFIERS

THICKENERS

SAND PUMPS



**LOWER MAINTENANCE!**


**LONGER LIFE!**

**MORE DEPENDABLE!**

*A JOY Belt Conveyor providing efficient, reliable main haulage.*

# JOY BELT CONVEYORS

## FOR GATHERING OR MAIN HAULAGE



JOY Belt Conveyors do a highly capable, low cost transporting job, whether out of the entries or over the long haul. Rugged construction, sealed precision bearings which require no lubrication for life, and low power consumption are features that

mean efficient, trouble-free operation... a smooth uninterrupted flow of coal with no waiting for empties, no matter how long the haul. • Wherever you need a belt conveyor (or chain and shaker types) use *proved* JOY Equipment for *best* results.

*This team moves tonnage fast—a JOY Shuttle Car with elevating discharge unloading onto a JOY Belt Conveyor.*

W&O CL 2821

*Consult a Joy Engineer*



# JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

In the **JOY**  
**FA CHAIN CONVEYOR**  
you get the advantages of  
**COMPLETELY**  
**NEW DESIGN**



Built in 12", 15" and 20" Widths



## *Simple V-Belt Drive*

No troublesome flexible coupling to line up, service and maintain.

## *Integral Speed Reducer saves 500 lbs.*

Highly efficient helical and spur gear reducer. Tucked away under the trough and protected.

This section easy to handle and move...when removed from base, it's on its own skids.

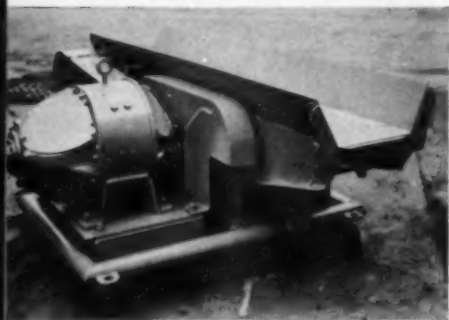


## *Easy to Reverse - and in far less time*



Much simpler operation.  
Far fewer parts to handle and less man-hours required.

## *Requires 4 sq. ft. less floor space*



For complete information on the Joy FA Chain Conveyor, write for Bulletin LD-200

Can be used in more restricted areas. More compact, easier to install, requires less level foundation space.



*Consult a Joy Engineer*

W&O CL 5746

# JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

# IN CONVEYOR MINING JOY SHAKERS

## STAND AWAY OUT IN FRONT



*Rugged · Foolproof  
Adaptable  
Better in Every Way—*

JOY Shaker Conveyors move coal fast, efficiently, and more dependably! Wear and strain on the parts are reduced by the exclusive JOY "Cushion Stroke" drive, resulting in longer service life, fewer parts replacements, and lower operating and maintenance costs. • There's a combination of JOY Shakers and Conveyor Sections to handle any room and entry conditions—write for Bulletin.



*Consult to a  
Joy Engineer*

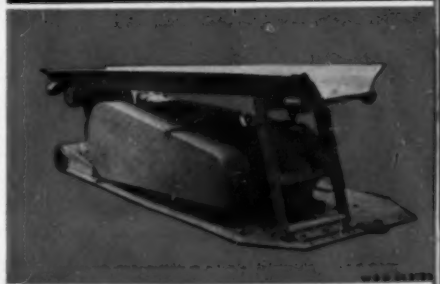
JOY Shaker Conveyors are designed to meet any bend or turn requirements without slowing production.



A JOY Shaker loading into a JOY Elevating Conveyor.



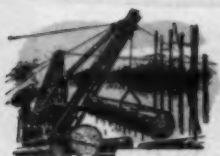
The compact driving section of a JOY Shaker features the exclusive "Cushion Stroke" drive . . . may be placed anywhere along the length of the conveyor.



# JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO



For Logging



For Sand and Gravel



For Aircraft



For Marine



For Stone Quarries



For Construction



For Elevators



For Mining



For Drilling



For Industrial

For better service and more economy

# MACWHYTE

PREformed... Internally Lubricated

# WIRE ROPE

*A thousand and one* to order from  
assures the right rope for your equipment

It will pay you to get Macwhyte Wire Rope, engineered and job-proved for your particular equipment. Over the years, ropes for all types of equipment in every field have been developed by Macwhyte. Recommendations are promptly available from Macwhyte distributors or Macwhyte Company. You get the correct wire rope for your equipment when you buy Macwhyte.



**MACWHYTE  
COMPANY**

KENOSHA, WIS.

MACWHYTE COMPANY, 2931 Fourteenth Avenue, Kenosha, Wis.  
Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope. Catalog available on request. Mill depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.

BULLETIN 5025 gives information on "How to order Wire Rope" and lists all sizes and constructions of Improved Pile Steel Monarch Whyte Strand Wire Rope. Copy sent on request.

**THIS IS  
THE BAR**

**BOWDIL CUTTER BAR**



High physical alloy steel . . . all welded, rivet-free construction. The strongest bar in the industry made for all standard cutting machines.

**THAT  
CARRIES  
THE CHAIN**

**BOWDIL FABRI-  
FORGED CHAIN**



Drop forged lug body built for many times normal load, circles bar in true running radial track guide with lug shoulders absorbing shock, strain, stress, thrust.

**THAT HOLDS  
THE BIT**

**BOWDIL BITS**



Special heat treat and design that saves power, time and money. The most popular cutting bit in coal mining has imitators but no equals in performance or economy.

**THAT CUTS  
THE COAL**



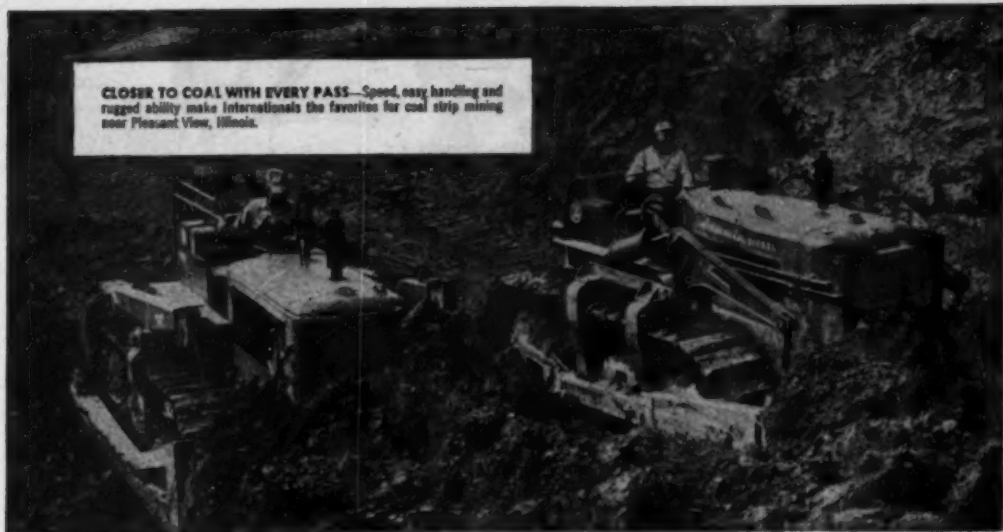
More coarse cuttings, less bug-dust, more profitable stoker . . . with less drag, less power consumed.

**AT LOWEST POSSIBLE COST PER TON**

SALES ENGINEERS IN — Whitesburg, Kentucky — West Frankfort, Illinois  
Charleroi, Pennsylvania — Denver, Colorado — Big Stone Gap, Virginia  
Danville, West Virginia — Canton, Ohio — Birmingham, Alabama  
Helper, Utah — Kansas City, Missouri — Centerville, Iowa — Topeka, Kansas  
New Castle, England — Alberta, Canada

**THE  
BOWDIL  
COMPANY  
CANTON, OHIO**

**CLOSER TO COAL WITH EVERY PASS**—Speed, easy handling and rugged ability make Internationals the favorites for coal strip mining near Pleasant View, Illinois.



# DOUBLE EXPOSURE

## AT PLEASANT VIEW

**Two Internationals peel off clay and rock to expose coal at reduced cost for Paisley and Smith**

Thirty feet beneath the pleasant view near Pleasant View, Illinois, is a coal layer well worth getting out. But first Paisley & Smith Company had to doze off a thick layer of heavy, sticky, wet clay, followed by a layer of rock.

They teamed up two big red Internationals—a TD-24 and a TD-18A—and did the job in jig time. Owner Smith and both

operators were enthusiastic, and here's what they have to say:

"Both these tractors do a wonderful job for us," they report, "and the TD-24 is the best machine for a strip mine we know of. It's tremendously powerful and quick and easy to handle. It does more work than other tractors and does it at reduced cost!"

Ask your International Industrial Distributor today for the low-down on "Power that Pays." Check up on his service facilities and complete parts department. Then you'll know how he can keep your equipment in the field paying out in hard work over the years ahead.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

INTERNATIONAL



POWER THAT PAYS



*Only Carlon ...*

**the first real pipe that is plastic!**

Impervious to the chemical attack of sulphurous waters, alkalies, metallic salts and other corrosive wastes, **ONLY CARLON** meets the stringent requirements of mine piping installations. Guaranteed against rot, rust and electrolytic corrosion, it has a service life many times that of metallic pipe in both underground and surface mining operations.

Lightweight **CARLON** pipe installations can be made in minimum time without the need of heavy materials handling equipment or special tools. It can be installed rapidly for emergency service, or set up quickly and easily for permanent operation.

Flexible and rigid types of **CARLON** are produced in all standard pipe sizes. Flexible pipe is furnished in long lengths which require few-

er fittings per installation and conform to irregular surface contours as well as slope or entry direction. Rigid **CARLON** is supplied in threaded and coupled random 21-foot lengths which can be joined rapidly by threaded plastic fittings.

A complete line of standard I.P.T. plastic fittings is available to join lengths of **CARLON** or to connect this new pipe with previously installed metallic systems.

At present, raw material shortages are limiting the production of certain types of **CARLON** pipe. Every effort is being made to overcome this problem and to meet the need for **CARLON**... the first real pipe that is plastic.



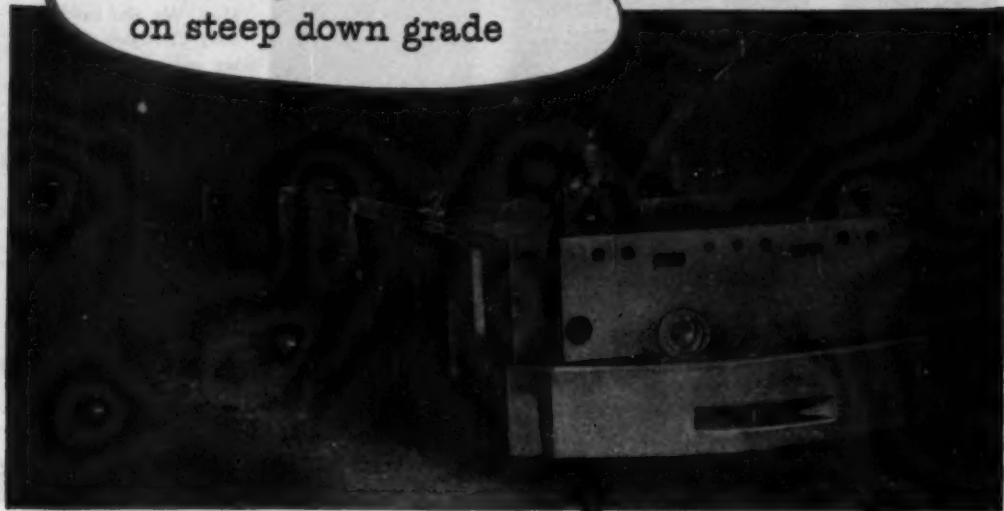
**CARLON PRODUCTS CORPORATION**

10462 Mesch Avenue

Cleveland 5, Ohio

In Canada: Micro Plastics, Ltd., Acton, Ontario

**PROBLEM:**  
**Runaway locomotives**  
**on steep down grade**



**SOLUTION:**

## **"CONTROLLED TONNAGE"** **...with dynamic braking**

A long, severe downgrade on the main line haulage-way presented a serious problem for locomotives operating in this mine. Heavily-loaded trains would over speed. Several accidents occurred. Speed could be controlled by reducing tonnage, but that was not the answer, as maximum hauling capacity was needed.

Westinghouse, asked to provide a solution, developed a "controlled tonnage" system. A Westinghouse Mine Locomotive, equipped with a dynamic braking circuit controlled by a limit relay, was put in service. At the top of the grade the locomotive goes into dynamic braking automatically and proceeds down the grade

at a predetermined speed. At the foot of the grade, control of the locomotive is automatically restored to the motorman. Operation has been very satisfactory —full capacity is obtained with complete safety.

When production depends on the right mine locomotive, or the right application of locomotive haulage to your problem, you can depend on Westinghouse. Ask your nearby Westinghouse office for data and application help, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Penna.

J-15163



YOU CAN BE SURE...  
**Westinghouse**

**MINE LOCOMOTIVES**



Vulcan Face Conveyor discharging into Vulcan Room Conveyor in a West Virginia Mine. We also build Gathering Conveyors, for receiving and conveying the discharge from several room conveyors. Bulletin A-408, fully illustrated, gives complete information regarding all sizes and types of Vulcan Chain-and-Flight Conveyors.

## Dependable Underground Conveyors

When you want Underground Conveyors that can be relied upon to stand up under heavy loads, remember that Vulcan has been building them that way for more than a quarter of a century. Modern designs and very sturdy construction assure trouble-free operation for long periods of heavy-duty service, when properly installed and cared for.

Write us regarding any requirement for

either Chain-and-Flight or Shaking-Chute Conveyors. We manufacture both kinds in a wide range of types and sizes, together with a complete line of Chutes, Screw-Jacks, Roller-Carriers and other accessory equipment. Illustrated bulletins describing these and other Vulcan equipment for the Mining Industry (see list below) mailed promptly on request. No charge or obligation.

### VULCAN IRON WORKS

Established 1849

### WILKES-BARRE, PA.

Heavy-Duty Electric Hoists  
Self-Contained Hoists  
Scraper Hoists  
Car-Spotting Hoists  
Room Hoists

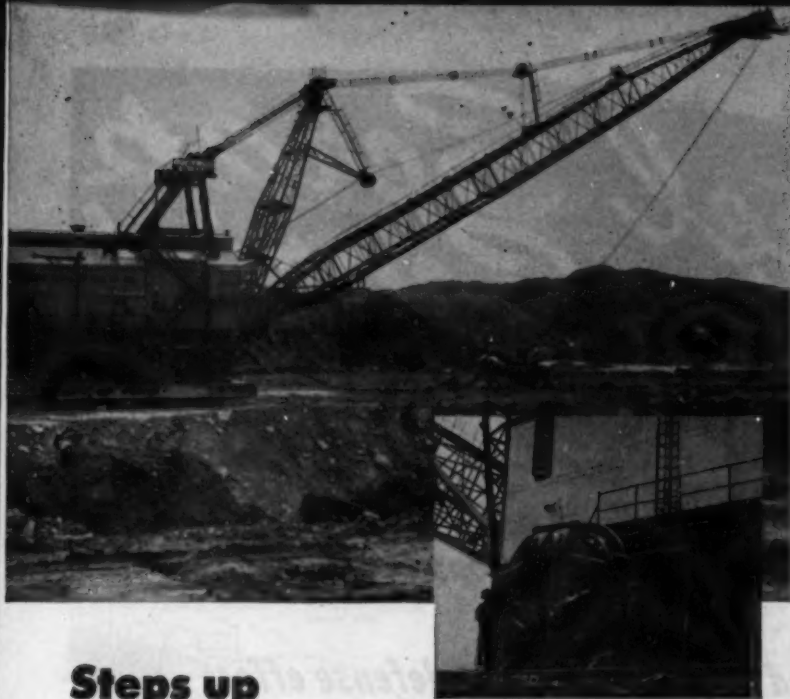
Shaking-Chute Conveyors  
Chain Conveyors  
Cast-Steel Sheaves and Gears  
Copex, Skips and Gunboats  
Teethed Double-Roll Crushers

Steam Locomotives  
Diesel Locomotives  
geared and electric drive  
Gasoline Locomotives  
geared and electric drive

Load-Carrying Lorries  
Rotary Kilns, Coolers and Dryers  
Briquetting Machines  
Heavy Special Machinery  
Open-Hearth Steel Castings

Vulcan ET-1 Shaking-Chute Conveyor discharging into mine car against heavy adverse grade. Other types available for lighter service and for use in low coal. Bulletin A-242, fully illustrated, gives complete information regarding all types and sizes of Vulcan Shaking-Chute Conveyors and accessory equipment.





## Steps up efficiency of walking dragline...

**L**UBRICATION of the walking cams on a 13-ton dragline proved troublesome for operators of the Sherwood-Templeton Coal Company, Linton, Indiana. Various lubricants tried on the cams were difficult to apply because they required heating for application. Also, lubricants tended to run off cams, thus failed to give adequate lubrication, caused high lubricant consumption, created hazardous working conditions around the walking cams.

A Standard Oil lubrication specialist recommended Standard Oil's **HEAVY-DUTY CAM AND GEAR LUBRICANT** for this job. A trial clearly indicated the advantages offered by this product. Because the **HEAVY-DUTY CAM AND GEAR LUBRICANT** can be easily removed from paper-type cartons and applied in solid form, application was handled with minimum time and labor during moving operations. The lubricant spread readily when cams rolled over but did not tend to run off. It formed a strong lubricating cushion that minimized vibration of the walking cams.

### HEAVY-DUTY CAM AND GEAR Lubricant

Comparing the use of **HEAVY-DUTY CAM AND GEAR LUBRICANT** with the best of previous products tried, operators estimated a reduction in lubrication cost of 40%.

The experience of the Sherwood-Templeton Coal Company points to savings you can make through the use of Standard Oil's lubrication engineering service and high quality products. How you can easily and quickly put this lubrication service to work for you is explained at the right.

Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Ill.

## What's YOUR problem?



**Kenneth Dix**, of Standard Oil's Evansville, Indiana, office, is the Standard Oil lubrication specialist who was called in by operators of the Sherwood-Templeton Coal Company. His practical experience and special training enabled him to recommend a lubricant that solved this company's lubrication problem and brought about important savings.

Kenneth Dix is one of a corps of Standard Oil lubrication specialists located throughout the Midwest. These men are especially trained to help you with your plant's lubrication problems. To obtain the prompt, on-the-spot services of an experienced lubrication specialist, phone or write to your local Standard Oil Company (Indiana) office.

When the specialist calls, discuss with him the benefits offered you by such products as:

**STANOIL Industrial Oils**—Simplify your lubrication jobs by using this one line of oils that provides cleaner operation of loader and crane hydraulic units, supplies effective lubrication in compressors, gear cases, and circulating systems.

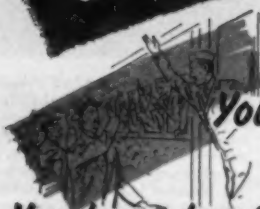
**SUPERLA Mine Lubricants**—These new, improved oils and greases provide better lubrication of cutters, loaders, locomotives, mine cars, and other underground equipment. They eliminate transmission-case deposits, reduce clutch-plate gumming, and minimize wear on gears and bearings.

**CALUMET Viscous Lubricants**—On open gears and wire rope, these greases resist washing and throw-off. Their superior wetting ability affords better coating of gears and better internal lubrication of wire rope.

**STANDARD OIL COMPANY (INDIANA)**



# Steel Scrap is Very Scarce!



*You have given your sons to the Armed Forces*

*You have devoted your plants to the defense effort*



*You have joined Civilian Defense*

*You have bought Defense Bonds...given your blood*



## Now...will you turn in your scrap?

Without vital scrap, the steel so desperately  
needed cannot be made.

Round up your scrap — call in your scrap dealer TODAY!



**The Colorado Fuel & Iron Corporation**

AMERICAN WIRE FABRICS CORPORATION, Mt. Wolf, Pa.  
CLAYMONT STEEL CORPORATION, Claymont, Del.  
THE CALIFORNIA WIRE CLOTH CORPORATION, Oakland, Calif.  
WICKWIRE SPENCER STEEL DIVISION, New York, N.Y.



# Here is *Exactly WHY* a V-Belt with **CONCAVE SIDES** Gives You *Longer Wear!*

## What Happens When a V-Belt Bends:

Straight-Sided V-Belt



Fig. 1



Fig. 2

Gates Vulco Rope with Concave Sides



Fig. 1-A



Fig. 2-A

Now, Straight-Sided V-Belt Bulges in Sheave-Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear At Point Shown by Arrows.

The Concave Sides Fill Out to a Perfect Fit in the Sheave Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley—Uniform Wear—Longer Life!



## The CONCAVE SIDE

(U.S. Patent No. 1813698)

To see for yourself how a V-Belt that has concave sides is certain to give longer wear, just make this simple test:—

Pick up any V-Belt you have at hand. Bend that belt as it bends around a pulley. As it bends, grip its sides between your fingers. Here is what will happen everytime.

If the V-Belt you are testing has straight sides, you can feel those sides bulge out as the belt bends. This out-bulge forces the sides of the belt to press unevenly against the V-Pulley and you naturally get concentrated wear just where the bulge is greatest—as shown in figure 1-A, at left.

Now, make this same test with the belt that is built with Concave Sides—the Gates Vulco Rope!

Whereas you felt an out-bulge when you bent a belt with straight sides, you find that the Concave Sides merely fill out and become perfectly straight. The sides therefore press evenly against the V-Pulley. This distributes the wear uniformly across the full width of the belt. Naturally, this means longer belt life and lower belt costs for you!

Only V-Belts made by Gates are built with concave sides. Whenever you buy V-Belts, be sure that you get the V-Belt with the Concave Sides—The Gates Vulco Rope!

Gates Vulco Rope Drive on the Mine fan of Sloss Sheffield Steel & Iron Company, Birmingham, Alabama. The drive operated 24 hours a day for 3 years without down-time.

CS-317

**Gates**

Have V-Belts,  
Molded Rubber Goods  
For Industry

**VULCO  
ROPE**

**DRIVES**

ENGINEERING, PARTS, AND JOBBER STOCKS  
IN ALL INDUSTRIAL CENTERS

THE GATES RUBBER COMPANY

DENVER, U. S. A.

The World's Largest Makers of V-Belts



*The Miner  
Comes Up...*



*The Loader  
Stays Down*

*Working!*

## with WHITNEY Universal Mine Chain

Here's one investment that will pay you daily profits ... it's the new Whitney Universal Joint Mine Chain.

Shifts change — miners come up — but loaders equipped with Whitney Loader Chains stay at-the-face getting out coal. The reason — Whitney Chains are expressly engineered to stand the wear and tear of the toughest mine service. For instance, Whitney's new flight design eliminates localized stresses in flight studs. This feature reduces breakage and costly down time. Alloy steel chain parts assure longer operating life.

Whitney Loader Chains further reduce your operating costs because they permit

on-the-job chain repairs if necessary. All you need is a few sections of packaged chain and flight sections, a wrench and hammer and the loader is ready to keep working in a few minutes.

Look into the new Whitney Mine Chain, today. See for yourself how this outstanding chain will lower your costs, simplify maintenance and reduce inventories. Get in touch with your local Whitney distributor — or write us for complete information on this fine-Engineered Whitney Loader Chain.

**WHITNEY CHAIN COMPANY**  
210 HAMILTON STREET, HARTFORD 2, CONN.

# HOW OUR BABY HAS GROWN!

**I**t was only a few years ago that we looked for the first time at our new No. 5 Steel Tie and said proudly, "Here's a husky youngster that's going to make its mark in the world."

Saleswise, of course, it was the baby of the Bethlehem tie family. But what a baby! Weighed five pounds per foot and was far sturdier than many people thought necessary. But Bethlehem felt that increased sturdiness was soon going to be needed in mine track. Mechanized equipment was steadily growing heavier. Loads were getting bigger. Everything pointed to the need for a rugged steel tie that could be taken up and reused many, many times. The No. 5 was it.

And now—1951—the No. 5 is Bethlehem's largest seller. How that baby has grown!

It's a better tie than ever, today. You can depend upon it to carry those big motors, cutters, and loaders without buckling or sagging. Broad, deep, thick, it effectively resists vertical pressure . . . and a special channel construction gives added support where it is needed most.

It's so easy to install, too. Simply fit the stationary clip against the rail base; tap the revolving clips into

place. Repeat at the other end. There's your tie . . . in and ready for work.

We'd like to tell you more about the No. 5. It makes good listening. Why not ask a Bethlehem man to show you what it will do for your track?



## BETHLEHEM NO. 5 STEEL TIE

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation, Export Distributor: Bethlehem Steel Export Corporation

**Put a Firecracker**

**in a Basket of Eggs...**

**...but, in your mine, with**

**ALDOX**

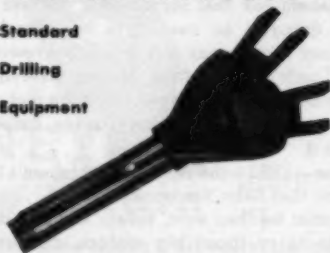


**COAL RECOVERY DRILL**

Designed to salvage profitable tonnage where overburden removal has become too costly for further stripping. Cardox-Hardsocg Augers, available in diameters of 20" to 40", carry the coal in a continuous flow from the seam. Illustration above shows "hook-up" with portable conveyor for automatically loading trucks or cars.

**CARDOX-HARDSOCC**

Standard  
Drilling  
Equipment



The Cardox-Hardsocg line of proven drilling equipment features carbide tipped and standard cutterheads, augers ranging from 2" to 8" in diameter, bits, wedges, thread-bars, sockets, boxing and boxing liners.

*Write for*

descriptive bulletins of  
operating details and  
ASK FOR a free survey  
by a Cardox Corporation  
engineer.

**CARDOX CORPORATION**

BELL BUILDING • CHICAGO 1, ILLINOIS

and you expect to lose a lot of eggs

# or **CARDOX**

## **both Non-Explosive Mining Methods**

there is no shattering explosion. You break down coal with minimum loss in fines—greater realization and increased production. *With more premium size coal* in every ton mined, cleaning costs are much less. Since both methods are widely accepted as safe for on-shift use, high production can be maintained.

Either Airdox or Cardox dislodges coal with a non-shattering piston-like push,—without smoke, fumes or flame. Cardox exerts the great power of expanding carbon dioxide—Airdox is a special application of compressed air. Either method can improve your operation, but which is best suited to the conditions of a given mine can be determined by a Cardox Corporation engineer in conference with your technical staff.

*You can contact us on this question without committing yourselves in any way. Write us about it.*



## "These wire rope figures really opened our eyes!"

"Couple of years ago, the boss asked me to start checking our wire rope costs. He wanted a little system of records that would tell us what each rope was doing, and how much work we were actually getting from it. Figured we could learn the brand that would last the longest—and cost the least—on our type of work.

"So I started keeping track. In our case, the jobs involving rope boiled down to a matter of tonnages moved. Wasn't at all hard to record what each rope accounted for in its lifetime. When I'd been checking long enough for the figures to have some meaning, I showed 'em to the boss. By then I could tell which make of rope was doing the best job for us, costwise

and every way. The figures really opened our eyes!"

These men weren't the first to learn the value of checking rope performance. Many users of Bethlehem wire rope follow the practice regularly. We're always glad to see it, for it enables actual comparisons between brands . . . and we know that in any such comparisons, Bethlehem rope will stand out from the crowd.

Here's a fair suggestion: over a period of time, stack the Bethlehem product against any other brands of your choice. Keep tabs on them all, and at intervals study your figures. Our guess is, those records of yours will prove beyond question the solid economy—the long-term economy—of Bethlehem wire rope.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation  
Export Distributor: Bethlehem Steel Export Corporation



## LET YOUR RECORDS TELL YOU!




# A NEW METHOD

## OF SHORT INTERVAL DELAY FIRING FOR WELL DRILL BLASTS

### Du Pont Primacord "MS" Connectors

1. Increase safety by eliminating electric blasting caps.
2. Allow unlimited flexibility in planning sequence-firing layouts.
3. Greatly simplify the hooking-up operation.



Du Pont Primacord "MS" Connectors consist of a copper tube  $2\frac{3}{4}$ " long containing a delay element that creates an average interval of 16 to 17 milliseconds. At each end of the tube, a 12-inch section or "tail" of Primacord is crimped in place (see sketch at left). These sections are spliced or taped into Primacord trunk lines to provide any desired arrangement of delay firing. Electric blasting caps, either regular or delay, are entirely eliminated from the body of the shot. No caps are needed except for initiation of trunk line, and these are not attached until the shot is ready to fire.

The number of intervals possible is unlimited, and the new "MS" Connectors are readily adapted to a wide variety of blasting layouts. The typical multiple-row drill pattern shown at right provides sequence firing both for individual holes as well as rows. In this arrangement the shot is detonated at the open corner (point of greatest relief) formed by intersection of the face and the free end. Where ends of the shot are tight, the blast can be initiated at the center.

Hook-up operations are simple and fast. Du Pont Primacord "MS" Connectors pro-

vide the most convenient and fastest means yet devised for delay firing from the surface.

"MS" Connectors are proving a valuable addition to existing methods of surface initiation and in many cases will replace use of



x Shows location of "MS" Connectors

blasting timers and short interval delay electric blasting caps. The Connectors are now available in units of 25, packed in cardboard tube with screw top.

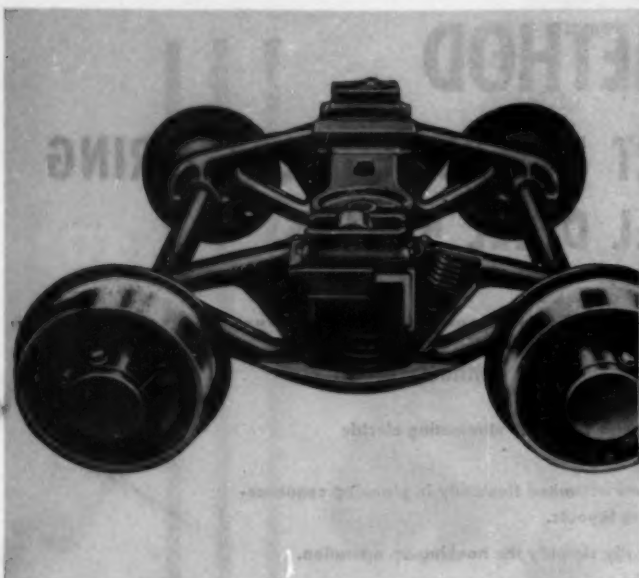
Ask your Du Pont explosives representative for additional information or write for Technical Service Bulletin No. 12. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.



BETTER THINGS FOR BETTER LIVING  
... THROUGH CHEMISTRY

## DU PONT EXPLOSIVES

Blasting Supplies and Accessories



The NC-1 Truck climaxes 20 years of intensive research, providing (through the friction control mechanism shown in cut-away) protection to equipment, roadbed and lading with maximum wear life.



Willison Automatic Couplers save time with maximum safety . . . can be coupled at either end of car or locomotive . . . require no manual assistance. Close coupling eliminates damaging slack, permits high speeds with maximum stability.

## NATIONAL *products cut per ton costs!*

Latest example of National's pioneering in better equipment is the NC-1 Truck. Its sweeping advancements over conventional trucks include long soft springs, a friction mechanism—controlling vertical and transverse oscillations, a cast one-piece bolster with large lubricated center connection, and automatic frame alignment. The NC-1 has been designed with the same factor of safety that is required by the Association of American Railroads for full size railroad trucks, and embodies the same features which A.A.R. tests have shown to be essential to produce good riding qualities. For the best in profitable equipment, always specify National products.



National M-230 Rubber-Cushioned Draft Gear for cars operating through rotary dump. Soft initial-action, high-capacity rubber pads provide maximum impact protection, lengthen equipment life. Available in a range of capacities and design variations to fit individual requirements.

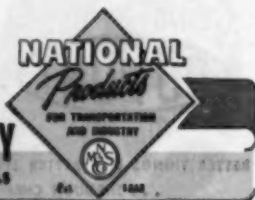


M-225 Rubber-Cushioned Draft Gear for locomotives and large capacity cars not required to operate through rotary dump. Maximum protection in minimum space.

A-205

### NATIONAL MALLEABLE and STEEL CASTINGS COMPANY

WILLISON AUTOMATIC COUPLERS • NC-1 TRUCKS • DRAFT GEARS • MACO STEEL WHEELS



# Here's Pin Point Crane Control

## Hydrocrane Spots Loads Within A Fraction Of An Inch

With every crane function fully hydraulic, operator can meter the power flow so slowly you can barely see the load move — or he can speed operation to provide a fast even work pace.

Here's what hydraulic action and control can mean to you:

**1. Telescoping boom** noses into windows, doors, box cars — without moving the crane an inch! Conveyor sections, mine machinery, beams, etc. can be eased into place quickly, accurately, without damage.

**2. "Deadman" Controls** provide automatic protection for men working around load. If operator lets go, all levers return to neutral — load stops dead. Mine timbers, cross bars, lagging can be handled in short order — with greatest safety to men.

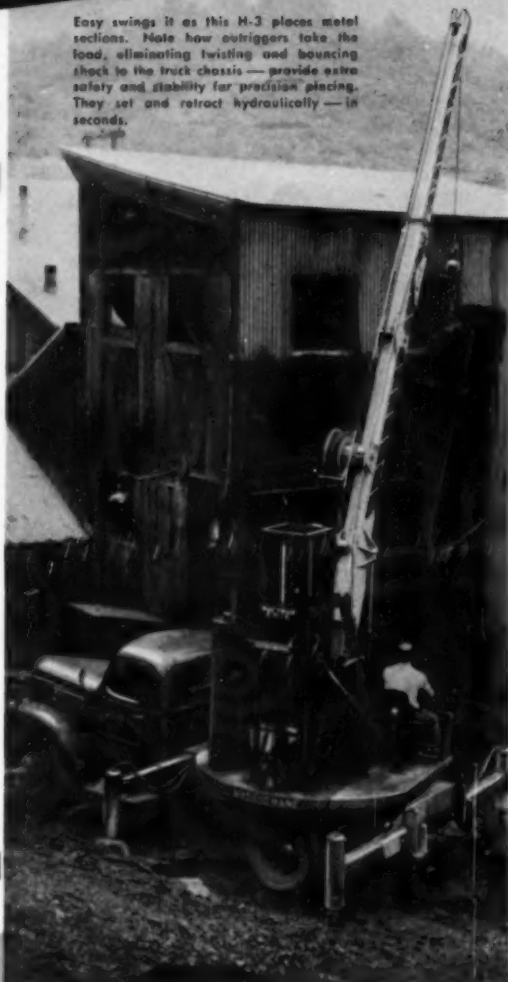
**3. Safe, easy operation.** No tricky hand-foot coordination, no foot brakes and clutches to slip or grab. Learning to operate a Hydrocrane is quick, easy — and safe.

Attachments include clamshell, crane hook, 1-yd. materials handling bucket, coal car cleaning bucket, magnet and grapples. Two sizes, 1/4-yd. 2-ton, 3/8-yd. 3-ton.

## BUCYRUS-ERIE HYDROCRANE DIVISION

South Milwaukee, Wisconsin

Easy swings it as this M-3 places metal sections. Note how outriggers take the load, eliminating twisting and bouncing shock to the truck chassis — provide extra safety and stability for precision placing. They set and retract hydraulically — in seconds.



### Owners Cut Shaft Mucking Time 35% With New Hydro-Mucker

Now a fast, mechanized way to remove muck in shaft sinking work — the Bucyrus-Erie Hydro-Mucker. Unit consists of hydraulically operated 3/4-yd. clamshell bucket, hydraulic pumps, electric motor and control bank. Bucket loads material from shaft floor to ship, car or rail from suitable conveyor for removal to surface. Owners report 35% faster mucking, 30% less manpower by using the new Hydro-Mucker.



**BUCYRUS-ERIE**  
**HYDROCRANE**

South Milwaukee  
Wisconsin

Gentlemen:

- ☐ Please send Hydrocrane Bulletins  
☐ Please send Hydro-Mucker Bulletin

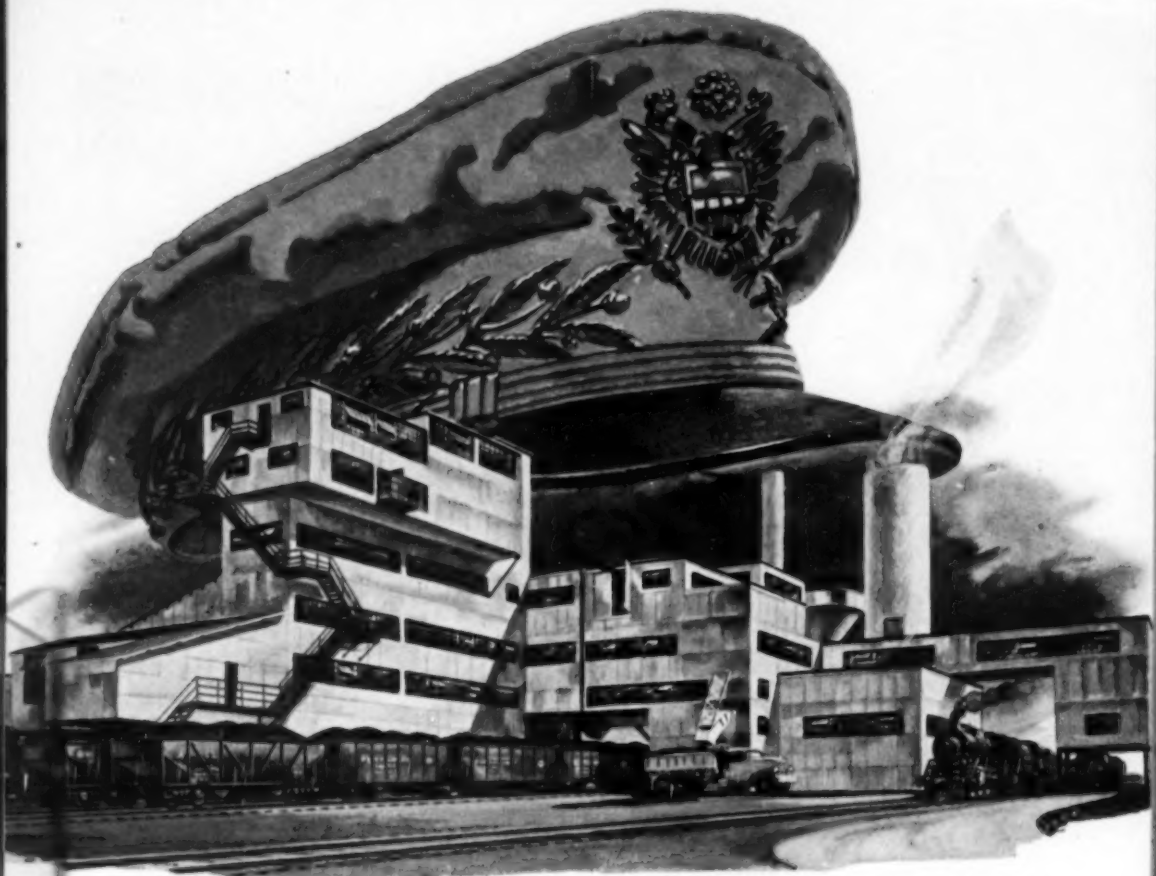
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Company.....

Address.....

City..... State.....

ST 2487



*Coal preparation plant of Bell & Zoller Coal & Mining Co., Buckhorn Mine, Johnson City, Ill.*

# COMMAND PERFORMANCE!

## ...In Peace or War

*Plants like the one illustrated* respond instantly to your orders. Yes, they produce a variety of premium fuels for use by industry, transportation, steel mills, synthesis, and domestic purposes. They conserve man power in war or peace, provide clean, sanitary housing for workers, and enable mine owners to meet and beat competition at a profit.

*You will recognize McNally Pittsburg coal preparation plants* by their uniform, characteristic flat-top cubical architecture. Like officers of the Military, they bear the marks of distinction that denote skillful performance and leadership.

*When you step inside* and see the specially designed equipment synchronized through a central control panel, you will realize that here is the utmost in operating efficiency.

*Let's talk over your ideas* of increasing markets—improving profits and stabilizing operations. **YOU CAN DO THIS BY MAKING YOUR COAL A BETTER FUEL.** The service of our consulting engineers is offered to you without cost or obligation.

**M'NALLY & PITTSBURG**  
MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

McNally Pittsburg Manufacturing Corporation—Manufacturing Plants: Pittsburg, Kansas • Wellston, Ohio.  
Engineering and Sales Offices: Pittsburg • Chicago • Rio de Janeiro • Pittsburg, Kansas • Wellston, Ohio



## BIG MOGUL

### ...Where Huge Tonnages Are Washed

*Increased tonnages of washed coal* can now be produced in the Mighty Mogul Washer without extra shifts and without extra man power.

*Raw coal cleaned in two stages.* Primary stage removes heavier refuse material. Secondary compartment separates coal into a bottom layer of middlings and a higher level layer of pure coal. Patented finger gate separates the layers discharging pure coal into the final delivery circuit. Middlings are discharged separately for reprocessing or may go direct to refuse. Refuse gate cannot jam, making it possible to wash a complete range of sizes up to 8 inch. Specific gravity can be changed at will.

*Greatly improved design features.* Hutch screw eliminated at the bottom of the washing cells. Maintenance eliminated on hutch screws. Improved impulse control valve permitting greater sensitivity of adjustment. Submerged Air Valve Exhaust . . . Lowers obstruction at floor level . . . Eliminates forming of mess on top of washer.

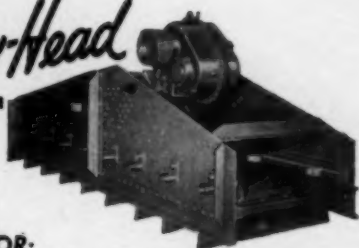
*Write for Bulletin 451.* Yours for the asking. It illustrates and fully describes the Mogul.

**M'NALLY & PITTSBURG**  
MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

McNally Pittsburg Manufacturing Corporation—Manufacturing Plants: Pittsburg, Kansas • Wellston, Ohio  
Engineering and Sales Offices: Pittsburgh • Chicago • Rio de Janeiro • Pittsburg, Kansas • Wellston, Ohio

# ANY coal screen need can be met with these three screens

## Low-Head Screen



### USED FOR:

- ▶ Primary dewatering of coarse coal following washers.
- ▶ Primary and secondary dewatering of small coal.
- ▶ Sludge dewatering.
- ▶ Desliming ahead of centrifugal dryers.
- ▶ Pre-wetting ahead of Heavy-Media Separators.
- ▶ Draining and washing media from coal and refuse following Heavy-Media Separators.
- ▶ Dewatering washer refuse.
- ▶ Dewatering and sizing middlings.
- ▶ Water clarification and recovery of soluble sludge.

Low-Head vibrating screens operate horizontally — save headroom and installation costs. Straight-line vibrating motion at 45° to the horizontal results in a definite conveying action and rapid stratification. Sizes 3 x 6 to 6 x 16 ft. Send for Bulletin 07B6330A.

## Ripl-Flo Screen

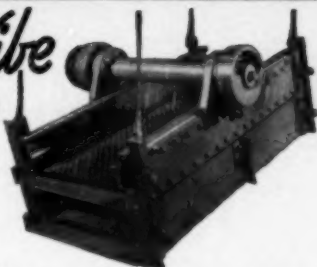


### USED FOR:

- ▶ Scalping ROM ahead of picking tables or crushers. (Extra Heavy Duty Ripl-Flo screen)
- ▶ Sizing raw coal ahead of washers or dry cleaners.
- ▶ Sizing and re-screening crushed coal into egg, ramp, nut and stoker grades, with 2, 3 or 4 separations.
- ▶ Primary dewatering of coarse coal following washers.
- ▶ Dewatering washer refuse.
- ▶ Dewatering and sizing middlings.
- ▶ Dry screening medium size moist coal. (Sta-Kleen deck)
- ▶ Dry screening small size moist coal. ("Tri-Slope" Sta-Kleen deck)

Ripl-Flo vibrating screens are built with only two bearings instead of four. Width is reduced 17%; weight by as much as 36% — low maintenance and power costs. Convenient clamping plates make it easy to change or tension screen cloth. Sizes 3 x 6 to 6 x 16 ft. Bulletin 07B6151B.

## Aero-Vibe Screen



### USED FOR:

- ▶ Sizing raw coal ahead of air cleaner.
- ▶ Dedusting.
- ▶ Dewatering sludge.
- ▶ Sizing middlings from dry cleaner.
- ▶ Dewatering coal following chloride washer.

Aero-Vibe screens, for fine to medium sizing, wet or dry, are easy to install and operate, require little maintenance. Amplitude of vibration can be changed by adjusting outer counterweights on each side of two-bearing concentric shaft. Sizes 2 x 4 to 5 x 10 ft. Bulletin 07B6099.

Your nearby A-C representative will be glad to show you how these coal screens can save money in your plant. Allis-Chalmers, Milwaukee 1, Wis.

# ALLIS-CHALMERS

Tarapex, Low-Head, Ripl-Flo, Aero-Vibe and Sta-Kleen are Allis-Chalmers trademarks.

Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.



Motors



Controls



Tarapex Drives



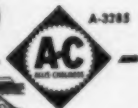
Vibrating Screens



Jaw Crushers



Kilns, Coolers, Dryers



# Your strong right arm...

## in time of need



**B**ECAUSE of the vast defense mobilization program, material shortages and extra production demands have gripped the nation. They affect particularly the heavy industries and the distributors and users of their products. And huge as America's facilities have become in recent years, they still are not large enough to keep pace with both military and civilian needs.

Nevertheless, as an owner of "Caterpillar" products, you are among the more fortunate. Your "Cat" equipment has been built for long life and to withstand severe working conditions. What's more, it is backed by a dealer organization that is world-famous for experience, accessibility, mechanical facilities and field service to keep you going "come hell or high water."

Since World War II, the already large number of "Caterpillar" sales-and-service establishments has increased greatly. Also since that time, "Caterpillar" and its dealers have developed new techniques for restoring and extending the life of "Caterpillar" products. Today, in their own shops, "Caterpillar" dealers can *rebuild* a great many worn or damaged parts which formerly required completely new replacement. In short, every dealer is richly acquainted with scores of modern ways and means for

keeping your machines in good working condition. You can help by doing this:

**Take your maintenance problems to your "Caterpillar" dealer BEFORE parts are worn beyond repair**

Remember that excessively worn parts can cause damage to mating parts; that track parts, pistons and liners, crankshafts, cylinder heads, radiators and other items usually can be salvaged. Your problems are your dealer's problems. Go see him today. He'll do everything in his power to keep your machines operating. Your combined efforts will be reflected in longer equipment life.

**CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS**

## CATERPILLAR

INC. U.S. PAT. OFF.

DIESEL ENGINES

TRACTORS

MOVER GRADERS

EARTHMOVING EQUIPMENT

# On the **TOUGH** Jobs Operators know JALLOY HEAT-TREATED PLATES

# J&L STEEL

... resist impact, abrasion and corrosion

... provide longer service life, lower maintenance costs



Cost-conscious mine operators throughout the industry are cutting maintenance and downtime costs by installing tough J&L Jalloy heat-treated steel plates on their equipment.

They've found that on the tough applications heat-treated Jalloy lasts 4 to 20 times longer than mild steel. The reason—Jalloy has the physical properties to resist the severe impact, abrasion and corrosion of mining operations. It is produced with a yield strength of 160,000 lbs. per sq. in. and a Brinell hardness of 341 to 388. The result—Jalloy saves money by cutting steel requirements, reducing downtime for repairs and replacement, and keeping labor costs for maintenance to a minimum.

Here are some of the applications where mine operators are using heat-treated Jalloy—Dump Truck Bottom Liners, Coal, Rock and Ore Chute Liners, Dipper Stick, Shovel and Drag Bucket Reinforcing. You can get Jalloy in bar form and in plates up to 72" wide and 20' long with thicknesses from  $\frac{3}{16}$ " to  $1\frac{1}{2}$ ".

Start finding out more about Jalloy today. Just write to Jones & Laughlin Steel Corporation, 411 Jones & Laughlin Building, Pittsburgh 30, Pa. We'll send you a free copy of our booklet, "For Longer Wear . . . Less Repair!" It will give you more complete information on the properties, heat treating and workability of heat-treated Jalloy, the modern mining and quarrying steel.

AMERICA NEEDS  
**SCRAP**  
TO MAKE MORE  
STEEL  
YOU CAN HELP

**JONES & LAUGHLIN STEEL CORPORATION**  
PITTSBURGH 30, PA.

# Above ground, too...



Reliance PRECISION-BUILT Totally-enclosed, Non-ventilated A-c. Motor.

## RELIANCE *Precision-Built* MOTORS

### do a Good Job on the Tough Jobs!



Reliance two-speed motor (top) effectively regulates volume of coal passed by eccentric feeder onto decline conveyor (right). Movement of conveyor with 12-ton load is controlled by Reliance two-speed motor with integrally mounted brake.

Wherever coal is mined, more and more operators are discovering that Reliance PRECISION-BUILT A-c. Motors provide the maximum in dependable and economical power on every job above and below ground.

These rugged, long-lived motors applied to shaking and vibrating screens, washers, pumps, air tables, crushers, feeders and conveyors will offer you invaluable assistance in keeping production up and costs down. PRECISION-BUILT Motors are made in all standard enclosures, in sizes from 3/4 to 300 hp. Write today for Bulletins B-2101 and B-2201. For Explosion-Proof Motor data ask for Bulletin C-130.

Sales Representatives in Principal Cities

# RELIANCE ELECTRIC AND ENGINEERING CO.

"All Motors are NOT Alike" • 1053 Franklin Road, Cleveland 10, Ohio

# **Coal Loading Is a *Natural* For the Powerful Whaley "Automat"**

There is not a coal loading machine built that can stand-up under the wear and tear of rock loading and do it consistently at high capacity like the Whaley "Automat!" This performance-proved fact makes the easier task of coal loading a natural for the "Automat." The exclusive shovel type loading head of this machine penetrates the coal or other material at the logical point—the bottom—and loads with the greatest possible ease! This ease of operation is important to the economical operation of your mine. It means the "Automat" runs smoother, has fewer breakdowns resulting in less down time and minimum maintenance. For coal or rock loading you need the dependable, economical performance of the Whaley "Automat". For complete information, write us today! Myers-Whaley Company, Knoxville 9, Tennessee



## **MYERS-WHALEY COMPANY**

# "Tycol Armitage boosts bearing life... smooths the way for faster, heavier loads"



Of course! Tycol Armitage Bearing Grease "stays put"

... keeps anti-friction bearings running smooth and cool. Its high stability makes it suitable for sealed anti-friction bearings that must last the life of the equipment.

Tycol Armitage possesses exceptional resistance to oxidation.

The dependable lubricating ability of this quality grease lengthens bearing life and cuts down maintenance costs.

Call your nearest Tide Water Associated office for further information.



Boston • Charlotte, N. C. • Pittsburgh  
Philadelphia • Chicago • Detroit  
Tulsa • Cleveland • San Francisco



SEND FOR A FREE COPY OF "TIDE WATER ASSOCIATED LUBRICIANA"

# Self clamping Tigerweld Rail Bond

- positions itself
- holds tight during welding
- gives out-of-the-way protection

The Tigerweld BF-10 Rail Bond is probably the simplest, the easiest to install and the most rugged of all welded-type rail bonds.

Look at it closely. The heavy steel terminal mates perfectly and it automatically lines up parallel to the track base. 2 or 3 hammer blows drive the terminal on with a bulldog grip. When you actually make the weld, you can be sure that the bond will stay put in the exact position you want.

The BF-10 Bond stays flat and snug against the rail base where it's away from dragging equipment. And to guard against the ruinous vibration of heavily-loaded cars, the bond is *butt-welded* to the terminal. Unlike other methods, butt-welding does not overheat or crush the wires. In fact, the joint is even *stronger than the strand itself*.

For more information on these long-life, trouble-free Tigerweld Bonds, write American Steel & Wire Co., Rockefeller Building, Cleveland 13, Ohio.



**HAMMER IT ON —  
alignment is automatic**



**MAKE THE WELD — bond stays in position**



**USE IT — it's permanent**



## American Tigerweld Rail Bonds

UNITED STATES STEEL

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES,  
CLEVELAND, OHIO

COLUMBIA STEEL COMPANY, SAN FRANCISCO,  
PACIFIC COAST DISTRIBUTORS

TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM,  
SOUTHERN DISTRIBUTORS

UNITED STATES STEEL EXPORT COMPANY, NEW YORK

# THE ONE SPIRAL THAT'S BRINGING DRILLING COSTS DOWN

HEXANSPEED  
COUPLING  
ASSEMBLY



SMOOTH  
CONVEYING  
SURFACE



Into the current picture of rising operating costs and general inflationary spirals, comes a new kind of "spiral" that's actually *cutting* mining costs—the Coalmaster Spir-L-Weld Auger.

Because the exclusive Spir-L-Weld process offers a new kind of flight surface, it reduces

resistance . . . minimizes clogging . . . lessens power consumption on equipment, and strain on operator. The Hexanspeed Coupling Assembly of the Coalmaster Spir-L-Weld Auger speeds up auger changing time, and has increased productive time at the blast hole by as much as 30%.

## Order from your nearest Coalmaster distributor

• Austin Powder Co.  
Cleveland, Ohio

• Dooley Brothers  
Peoria, Ill.

• Joy Manufacturing Co.  
Main Office, Pittsburgh, Pa.  
Representatives  
throughout the world

• The Buda Co.  
Harvey, Ill.

• Drillmaster Supply Co.  
Evansville, Ind.

• Mobile Drilling, Inc.  
Indianapolis, Ind.

• Diamond Supply Co., Inc.  
Evansville, Ind.

• Illinois Powder Mfg. Co.  
St. Louis, Salt Lake City

• Salem Tool Company  
Salem, Ohio



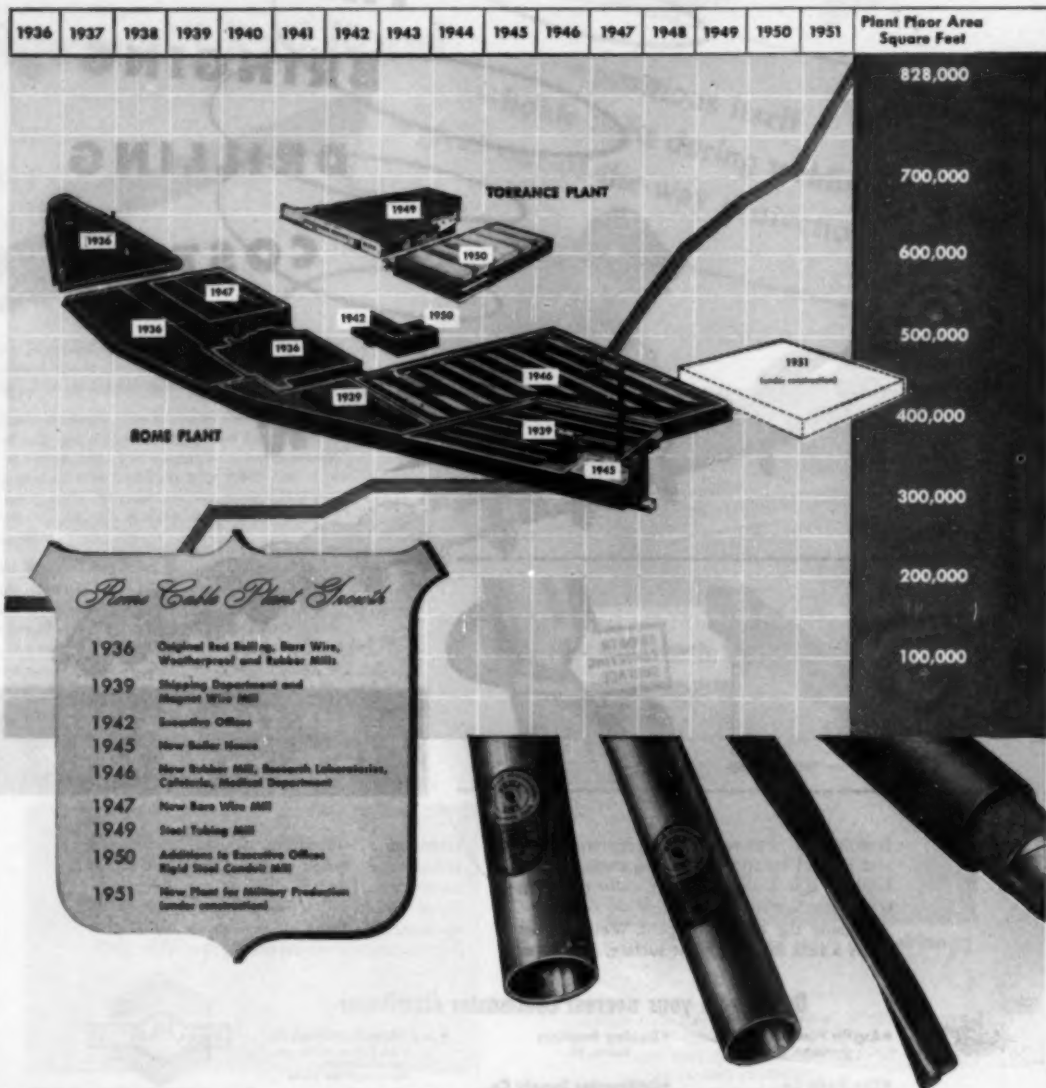
WRITE FOR NEW  
COALMASTER  
CATALOG

AUGERS • DRILL BITS • DRILL HEADS • DRILL SOCKETS • WEDGES

**CENTRAL MINE EQUIPMENT COMPANY**

ST. LOUIS 18, MO.

# 1936-1951



## FROM BAR TO FINISHED WIRE...FROM SHEET TO FINISHED TUBE

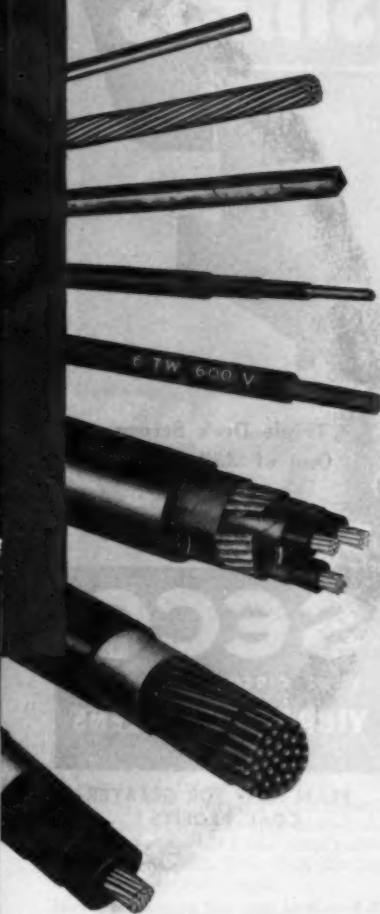
In the manufacture of wires and cables, as well as steel conduit, control of Rome Cable quality is a step by step process. Starting with basic forms... copper wire bars and sheet steel... Rome Cable products are manufactured entirely within its own plants. Equipment of the latest design, capable research and engineering, plus rigid inspection assure you of uniformly high quality.

Rome Cable offers, also a personalized service... based upon intimate contact between buyer and seller. Strategically located

sales offices and warehouses across the nation bring Rome Cable as close to you as your telephone. In this period of defense priority, material shortages are acute and delivery requirements cannot always be met. You can depend, however, upon Rome Cable doing its best and when it cannot, honestly saying so.

Write today for your complimentary copy of the attractively bound book, "The Story of Rome Cable Corporation," and learn more about Rome Cable's facilities.

# ... You've Helped Rome Cable Make The Years Count



Fifteen years ago this July, we made our first shipment of wires and cables to the electrical industry. Your ready acceptance of Rome Cable products since that time has more than justified our confidence in that first shipment.

Today, electrical power surges through Rome wires and cables of many types, in many places . . . powering vital industry, lighting cities, safeguarding life, bringing convenience and comfort to homes throughout the land.

Burrowing deep for vital minerals, carrying heavy power loads from city to city, turning the wheels of the nation's industry . . . Rome wires and cables are unfailingly at work.

When the farmer flips his barn switch for that 4 A.M. milking . . . when a hundred and one electrical conveniences are called into use . . . Rome wires and cables are at work.

When television gives you a ringside seat, when an electric mixer whips up a cool summer drink . . . or, a neon sign steers you toward a highway hamburger . . . Rome wires and cables are at work.

Yes, even when a telephone voice directs an artillery barrage into Korean hills . . . the vital thread of communication may well be a Rome product. For, today Rome Cable is, again, producing for defense.

So, for fifteen years Rome Cable has steadily grown in meeting your ever-increasing needs. Rome research and engineering have designed better cables, have maintained dependable, high quality . . . to give you of the electrical industry only the best.

At this milestone in our progress, we, again, dedicate our future to ever higher quality of product and the desire to serve you who have made these years count.

## ELECTRICAL CONDUCTORS AND STEEL CONDUIT OF BETTER QUALITY

***It Costs Less To Buy the Best***

**ROME CABLE**

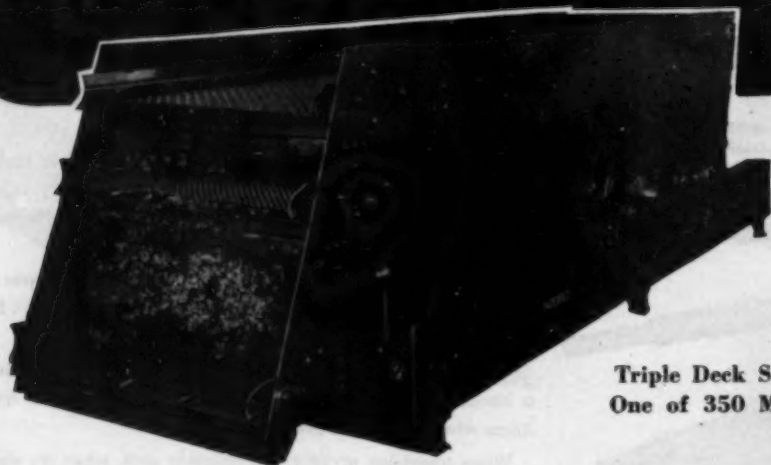
*Corporation*

ROME • NEW YORK

TORRANCE • CALIFORNIA



# This Means Business



Triple Deck Screen  
One of 350 Models

**For Producers who know that  
CLEAN, PROPERLY SIZED COAL  
is the key to today's profits.**

Here's the equipment that puts you in a straight line for greater profits from your coal production. Ruggedly built, smooth operating Seco Vibrating Screens will convert huge tonnages of R. O. M. into the wanted sizes . . . the higher profit sizes . . . for only pennies per ton.

It's a fact! You see the patented construction of Seco Vibrating Screens means more accurate sizing, better conveying action and smooth performance month after month . . . year after year . . . proven by hundreds of profit-minded operators . . . doing everything from scalping to final sizing.

Get the whole Seco story. Write for Coal Bulletin #11 Dept. C.

## SECO

TRUE CIRCULAR ACTION  
VIBRATING SCREENS

**PLAN NOW FOR GREATER  
COAL PROFITS!**

A Seco field man will go over your coal preparation requirements with you and make helpful recommendations. Why not request this service today.

Over 350 Models in Single, Double, Triple and 3 1/2 deck sizes to meet every coal screening need.

**SCREEN EQUIPMENT CO., INC.**

1730 Walden Avenue, Buffalo 23, N. Y.

In Canada: United Steel Corp., Toronto, Ont.



# GET THE MOTOR that Cleans Itself

**D**ROP YOUR MAINTENANCE COSTS to a new low by reducing motor cleaning operations and reducing inspections and overhauls. Tests have proved that on most applications totally-enclosed, fan-cooled motors more than pay back their extra cost in reduced maintenance. And this new Allis-Chalmers Type APZ tefc motor makes maintenance costs lower than ever before on this type of motor.

## Here's Why

Concealed air passages and pockets have been eliminated; dirt cannot build up to cause overheating. Cooling air is blown over the ribbed cast iron frame and bearing housings carrying dirt away with it. How about oily dirt that sticks? It can be wiped or blown off without stopping the motor.

Texscope and Vari-Fitch are Allis-Chalmers trademarks.

## Rigid Construction

The frame is rigid cast iron which not only has high inherent corrosion resistance, but also holds bearings in alignment. Bearings are pre-lubricated at the factory and should need no attention for years. Tapped holes with pipe plugs to permit regreasing and to provide grease relief are standard equipment.

## Get All The Facts

The new Allis-Chalmers Type APZ totally-enclosed fan-cooled motor is built in all NEMA standard frame sizes from 224\* to 505. Also in explosion-proof type. Your A-C Authorized Dealer or District Office has complete information. Call today, or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 51B6144.

A-3398

Sold ...

Applied ...

Serviced ...

by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.



**CONTROL** — Manual, magnetic and combination starters; push button stations and components for complete control systems.

**TEXSCOPE** — Bolt in fit alone and sections. Standard and Vari-Fitch chevron, speed changers.



**PUMPS** — Integral motor and coupled types from 1/2 in. to 72 in. discharge and up.

# ALLIS-CHALMERS



\*Similar design non-ventilated motors Type APK, also available in frames 203 to 224 inclusive.

# Rope leads from **UPSON-WALTON**



## How to lubricate wire rope

● Each wire in a rope is a "live wire"—since it moves with respect to its neighboring wires every time the rope bends or flexes. This causes wear, which can be reduced by proper lubrication.

In an Upson-Walton rope every wire is lubricated as it is stranded—thus lubrication is built in. However, for long life this lubrication should be repeated periodically. Use a lubricant which:

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- is adhesive enough not to be thrown off by vibration.
- will not either harden or soften under extremes in temperatures.

With proper care Upson-Walton wire rope will give you longer life, greater safety and greater economy. Use of the best materials and methods, and thorough testing are your assurance of quality. Specify Upson-Walton on your next job.

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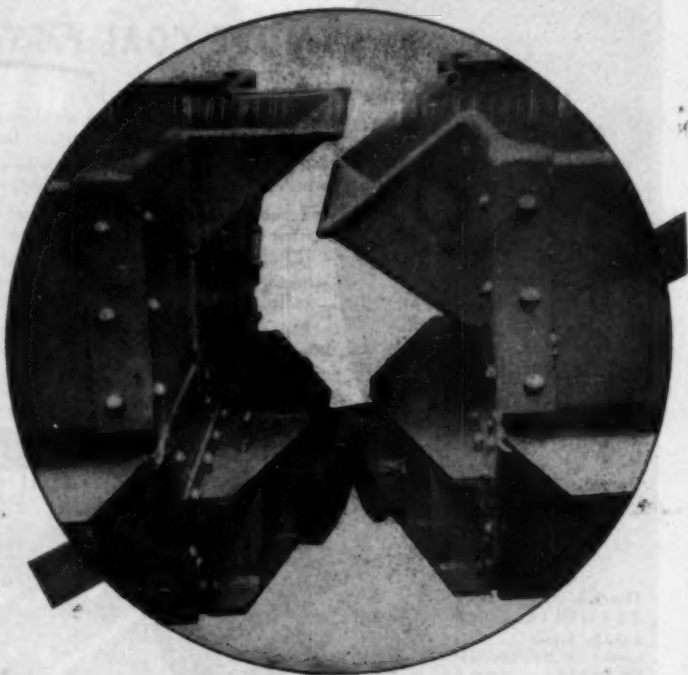


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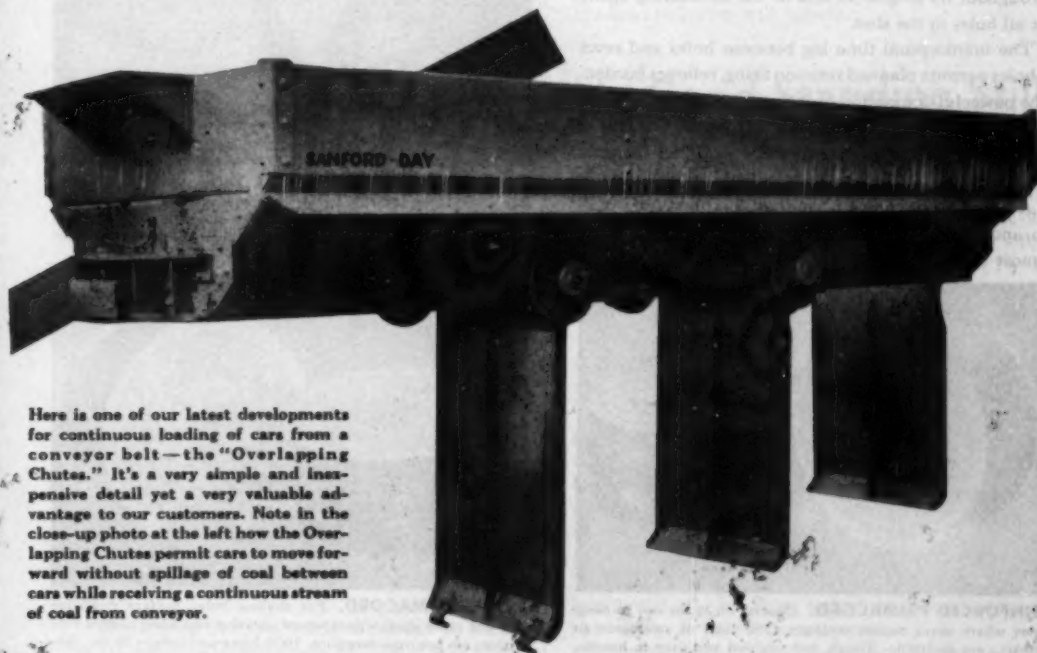
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The S-D "Automatic" System comprises any number of required cars (usually one-third to one-half the number of old cars) plus an adequate surge bin. On this particular change-over, it required only 16 S-D 1-2-3 "Automatics" to replace 100 old cars. This company also installed mechanical loading to cut costs to the very minimum all the way down the line and take full advantage of the non-stop, dumping-on-the-move cycle of S-D "Automatics." Think of it! Sixteen S-D "Automatics" and a surge bin replaced 100 end dump cars!

A surge bin of sufficient capacity is essential to continuous, flexible coal production and low cost operation because (1) it permits full time mine operation with only part time operation of screening plant, and (2) it guarantees independent non-stop operation of either screening plant or mine in case of temporary shut-down of one or the other.

If you are using obsolete, worn out cars in your mines, and are without a surge bin, let one of our engineers discuss improvements that will make coal mining more profitable. Drop us a line today!



Here is one of our latest developments for continuous loading of cars from a conveyor belt—the "Overlapping Chutes." It's a very simple and inexpensive detail yet a very valuable advantage to our customers. Note in the close-up photo at the left how the Overlapping Chutes permit cars to move forward without spillage of coal between cars while receiving a continuous stream of coal from conveyor.

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**WIRE COUNTERED PRIMACORD.** Armored with closely stranded brass wire, Wire Countered Primacord is the answer where deep, ragged holes and high abrasive conditions are encountered. The wire sheath increases tensile strength to 220 lbs. Weight per 1000-foot spool is 35 lbs.



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**THE ENSIGN-BICKFORD COMPANY**  
Simsbury, Connecticut

**DETONATING  
FUSE**

JULY, 1951

IVAN A. GIVEN, EDITOR

## Opportunity Now

IT'S A RARE THING when the paramount national interest dovetails urgently and perfectly with the best interests of an industry. That, however, is the way the situation is shaping up for coal. In short, to safeguard the national interest and foster future peacetime progress, development of a realistic fuels policy is a necessity—not at some future date but now. Such a policy must favor coal—certainly in the industrial field, to a considerable extent in the space-heating field, and in certain sections of the transportation field, in addition to those fields where coal is solidly entrenched. That already is foreshadowed by the recent Munitions Board directive to the military services that coal be given preference wherever possible.

The reason is not hard to find. Consumption of oil and natural gas, compared to reserves and productive capacity, is far out of balance. That imbalance is increasing and is bringing in its train growing dependence on oil imports and on long natural-gas pipe lines. Consequently, the day is at hand when all-out war, an interruption in oil imports, or other emergency, could leave the United States in a most-critical position. The solution is a fuels policy that will insure that each fuel will be used for the purpose for which it is best suited. On this basis, coal is the only answer for many applications where oil and natural gas are now being used—steam raising and space heating, for example, along with many others.

The United States already is far out on the limb in its growing dependence on liquid and gaseous fuels. The hazard, therefore, is immediate, and with it the need for action. The situation presents coal men with a rare opportunity for helping both their country and their industry. In fact, it is more an obligation than an opportunity. Two things clearly can be done. First, the coal industry must exert every effort to bring home the facts to the public and to those who make policy in the govern-

ment, accompanying this with concrete suggestions for the policy that events are showing is an absolute necessity. Second—and equally if not more important—the industry must make sure that all fuel users understand the situation and what coal offers not only from the national-security standpoint but as a low-cost, dependable source of energy now and in the future. The sooner these things are done, the sooner both the Nation and the coal industry will benefit.

## No Good Standing Still

"IT'S NO GOOD sitting on the floor!" Along with other natural expressions reflecting the size and scope of the exhibit and the technical program, this was one very-pertinent comment on the 1951 Coal Show at Cleveland. Another comment that is valid any time and also is tied directly to the No. 1 goal of coal mining is: "It's no good standing still!" That always has been true, but it took the advent of continuous mining to throw it into the sharpest-possible relief and consequently force the attention to the problem it really deserves.

Because of the importance of cost to the prosperity of the industry, it cannot be repeated too often that maximum efficiency is the result of two key steps: (1) installation of the most-modern production machinery that can be obtained, with, of course, due regard to the conditions at each particular operation, and (2) operation of that machinery, particularly the loading and auxiliary equipment at the face, every possible minute of the shift. Both top management and operating management have major responsibilities in putting these two principles to most-effective use. Top management, of course, must provide the equipment and operating management must see that it works the way it is designed to. Frequently, the task is simply one of doing the things that naturally should be done. But easy or difficult, doing the job right means real benefits for the mine, the company and the industry.

## The Defense Solid Fuels Administrator Tells . . .



Harris & Ewing

MR. CONNOR "The public's business should be conducted..efficiently and economically."



Wida World

WASHINGTON GOAL—Helping coal contribute its fullest share to "promote the national defense program and prevent undue strains and dislocations in the civilian economy."

# How DSFA Sees Its Job

DEFENSE SOLID FUELS ADMINISTRATION owes its existence to and derives its powers from the Defense Production Act of 1950. The powers of this statute are to be used, Congress declares, for one basic purpose—to promote the national defense.

These words, "national defense," run through the whole text of the act, shaping the course of its controls and explaining the reasons for them. National defense includes "... the operations and activities of the Armed Forces, the Atomic Energy Commission, or any other government department or agency directly or indirectly and substantially concerned with the national defense . . ." (Sec. 702 (d)).

All the activities of the Defense Solid Fuels Administration are directed toward the carrying out of that purpose.

To promote the national defense, the President was given broad powers. These provide for the granting of priorities and the allocation of materials and facilities. Hoarding and profiteering are banned. The important power to requisition needed equipment, materials and facilities is granted. Expansion of productive capacity and supply is provided for through government-guaranteed loans pro-

By CHARLES W. CONNOR  
Administrator  
Defense Solid Fuels Administration  
Washington, D. C.

cessed by Federal Reserve banks and through direct government loans to increase production.

Price and wage stabilization, settlement of labor disputes and controls on a selective basis or across the board also are authorized in the Defense Production Act. The granting of assistance to small business and provisions for the administration and enforcement of the act, as well as exemptions from anti-trust laws, are set forth in Title VII.

The over-all supervision of the exercise of these powers has been placed, by order of the President, in the director, Office of Defense Mobilization. The powers with respect to priorities and allocations, requisitioning, voluntary agreements, expansion of capacity and supply and certain other activities have been vested in the Defense Production Administrator and by him, with some exceptions, delegated to the Secretary of Commerce, Secretary of the Interior, Secretary of Agriculture and the Interstate Commerce Commission.

The Secretary of the Interior

has delegated to the Solid Fuels Administrator certain of the functions and powers with respect to solid fuels. These include the power to assign priority ratings to different uses of solid fuels, allocate solid fuels to essential uses, curb excessive inventories and make recommendations with respect to applications for loans and certificates of necessity covering facilities for expansion of productive capacity and supply.

The Defense Solid Fuels Administration also acts as claimant for the solid-fuels industries and, with the Defense Minerals Administration, for the mining-machinery manufacturing industry before other defense agencies for the purpose of obtaining for those industries allocations of scarce materials needed to produce solid fuels and to manufacture mining machinery.

In setting up our DSFA organization, we have attempted to start with first things first. We have made plans for all phases of the activities in which we may have to engage. We propose, however, to build our staff only as the need therefore arises. We are proceeding on the basis of my belief that the public's business should be conducted as efficiently and economically as a prudent man would

## What Coal Men Can Look for From Washington

conduct his own business affairs. Accordingly, our present organization is the minimum we can get along with.

In addition to the offices of the Administrator, two Deputy Administrators, one Special Assistant to the Administrator, the General Counsel and the Executive Officer, we have staffed only the Coke Division, the Materials Requirements Division, the Industry Finance Division and the Transportation Division. Most of these divisions have only a director and necessary clerical help.

### How Bureau of Mines Helps

But we do obtain services, on a reimbursable basis, from the Bureau of Mines. These are equivalent to two additional divisions. These two divisions are designated in our organizational set-up as the Economics and Statistics Division and the Conservation, Utilization and Technology Division.

The divisions planned and provided for but not yet staffed are: the Bituminous Division, the Anthracite Division, the Compliance Division and the Manpower Division.

The duties of these divisions now are being performed by existing offices and divisions, with the assistance of a few consultants and specialists who have been called in to help us on special problems. Most of these tasks will be of short duration and the majority of such services are performed without compensation.

We realize that we have not yet felt the impact of some of the problems that lie ahead of us such as manpower, distribution, exports of coal and coke and others, but we already are planning and, in some cases, actively working on such problems, so that we will be prepared to handle them intelligently when they confront us.

Every man on our staff is an expert in his line and on a basis of ability, competence and accomplishment will compare favorably with the best in Washington.

In addition to the services of our own staff members, there is available to us, with respect to the bituminous-coal producing industry, the advice and counsel of the National Bituminous Coal Advisory Council. Serving a similar purpose, there recently have been formed industry advisory committees for

both the coke industry and the mining-machinery industry. Other industry committees will be appointed as required.

DSFA was established by the Secretary of the Interior Dec. 4, 1950, to carry out the functions assigned to him under the Defense Production Act of 1950 with respect to all forms of anthracite, bituminous, sub-bituminous and lignitic coals and coke and its by-products. It is our job to see that adequate supplies of solid fuels are produced to meet the requirements of the defense program, as well as civilian needs, and to get them where they are needed when they are needed.

The demand for increased production of steel, chemical, electric power and steam generation, together with the expansion of general manufacturing, the increased burdens on railroad and vessel transportation and exports under the Mutual Defense Assistance Act, all require increased production of coal and coke. A kind Providence has been very generous to this Nation. We have ample reserves of coal. While much of our prime-quality coking coal has been used—and wasted—we still have sufficient reserves for the foreseeable future. Coals formerly considered unacceptable for coking purposes now are being made available through preparation and processing. The Technology Division, Bureau of Mines, which is functioning as a service division for solid fuels, is continuing to carry on research and investigation into such beneficiation and reserves.

### Coal—Key to Strength

Our coal resources always have been one of the vital factors in our economic strength—in peace or in war. In peace, coal is our most important single source of energy, supplying half of our total demands. In a national emergency, such as we face today, the needs for coal expand rapidly. The extent of these requirements is underlined by the fact that it takes 6 lb of coal to make 1 lb of smokeless powder, 2 tons of coal to make a 1-ton bomb and 220 tons of coal to make a modern tank.

The expansion of our electric-power industry will require huge tonnages of steam coal, and steel expansion will put pressure on our

supplies of high-grade coking coal. Coal shortages would drastically handicap our entire rearmament effort. DSFA is working cooperatively with the American coal industry to make sure that we have enough.

### How Supply and Demand Shape Up

Let us examine briefly our situation with reference to the supply and demand for each of our fuels and present some of the problems we shall be faced with in attempting to produce an adequate supply of each of them.

**COAL**—First, let us take a look at coal.

It has been stated that we have ample reserves of coal. We also believe that the mining industry has present productive capacity adequate to meet foreseeable demands, provided it is insured of necessary manpower, transportation facilities and machinery and supplies.

Because of total and partial work stoppages occurring in the first quarter of 1950, production of coal was seriously impaired. This reduced production was overcome during the last 6 mo of 1950, when approximately 299,000,000 tons of anthracite and bituminous was produced—a rate equal to approximately 600,000,000 tons per year. The actual production for 1950 was 512,000,000 tons of bituminous and 44,000,000 tons of anthracite. It is estimated that 560,000,000 tons of bituminous and 50,000,000 tons of anthracite, or a total of 610,000,000 tons, will be required for 1951. Of this, it is estimated that about 136,000,000 tons was produced in the first quarter, during which production was interrupted by the railroad switchmen's strike in February and March.

In the peak production year of 1947, the bituminous industry alone produced 630,000,000 tons while anthracite produced 57,000,000 tons. With increased mechanization and advancing technology since that year, the industry should not have difficulty in providing to the Nation any reasonable tonnage that may be demanded of it. Because the productive capacity of the coal mines is adequate to meet the present and foreseeable requirements of national defense, there is no im-

## Where Solid Fuels Stand—What They Can Do and What They Need

mediate necessity to allocate coal —always with the reservation that the industry is given the required men, tools and transportation facilities.

**COKE**—Slightly more than 72,000,000 tons of coke was produced in 1950. Of this amount, about 5,660,000 tons was produced in beehive ovens.

Based on estimated steel expansion, it is estimated that coke will be in tight supply at the end of 1951. Present coke productive capacity in 1951 is estimated at 78,500,000 tons. However, because of shortages in silica brick, steel and other materials, the full expansion anticipated in steel may not be realized. At the same time, conversions to natural gas, the temporary shutting down of some blast furnaces because of lack of iron ore, and other factors also may make unexpected supplies of coke available for steel production.

Even with such assistance, coke will continue to remain in tight supply and may require emergency measures in its production and distribution by DSFA. Some expansion of beehive coke production undoubtedly will be necessary to relieve demand pressures in certain areas. Further requirements for export coke also will have to be met.

Any substantial increase in coke-oven output can come only from additional construction of slot-type byproduct ovens. From incomplete records, it is doubtful that 1,000 new ovens, with estimated capacity of 5,200,000 tons, will be completed in 1951. During the same time, it is likely that 3,200,000 tons will be dismantled.

Thus it will be seen that providing an ample supply of coke will be one of DSFA's most important tasks. We are also cooperating with the Bureau of Mines in a survey of coke-oven plants to determine ways and means of increasing the output of benzene.

There is no immediate need to allocate coke, although serious shortages could develop rapidly if coking facilities do not expand concurrently with steel expansion. A shortage in coke supply would have dire consequences upon the national defense.

**EXPORTS**—In addition to the expanded needs of our own defense economy, we are being called upon to ship vast quantities of coal and coke to Western Europe. This year, our coal exports probably will be

the third highest in history. Western Germany and Great Britain, Europe's traditional coal suppliers, have been unable to keep pace with the needs of the Marshall Plan countries and large tonnages now are being transported to them from this country.

To meet the increased demand and to relieve the shortages of shipping facilities, additional ships are being made available by our government to carry coal and coke to Europe.

In addition to the demands from Europe, we will also have to supply larger quotas to Canada, South America and Japan. Preservation of balances sufficient to protect our own economy, while permitting diversions to fill the needs of our neighbors and providing for the necessary industry expansion to care for the needs of both, will require expert knowledge and sound judgment on the part of the staff of DSFA.

**TRANSPORTATION** — In an emergency we can greatly expand our coal output. During World War II, we supplied coal at the rate of 620,000,000 tons per year. Today, our coal industries are prepared to mine 650,000,000 tons annually—enough to meet even the vast requirements of total war.

But if we are to reach and maintain peak production, we must be sure that adequate transportation is available. Programs have been approved and steel has been allocated for additional railroad cars, lake ore boats, ship repairs, barges and tug boats. A substantial number of open-top coal cars will be required to move coal from the mines to the consumers. The car-building program is moving slowly at present but is expected to reach 10,000 cars per month shortly. This program must be pressed if the emergency coal needs of our economy are to be met. Bad-order cars must be repaired promptly by the railroads to get them into profitable use by their owners.

We are working in cooperation with the Defense Transport Administration, the Association of American Railroads, railroad companies, coal producers' associations, individual operators and state and city authorities to establish procedures for relieving acute shortages of solid fuels when they occur, as happened here and there during the switchmen's strike.

For the long-range program, we are developing procedures for the

allocation of solid fuels when and if necessary and we also are planning for the voluntary stockpiling of fuels in summertime to relieve the pressure on the mines and transportation facilities in the wintertime. Other plans include the substitution of fuels where necessary. Because of this transportation bottleneck and because coal cannot be stored at the mines, stockpiling of coal by industrial consumers and home owners is an important phase of our defense effort. Hoarding of coal is patriotic!

### SUPPLIES AND EQUIPMENT

—Because the solid-fuels industries have been energetic and far-seeing, this country today has adequate coal-production capacity and coking facilities are being expanded to keep pace with the expanding steel industry.

But all that is of no avail if the instruments of production are deficient. Those instruments embrace such items as mining machinery, equipment, repair parts, maintenance and operating supplies, trucks, tires and gasoline. The growing defense economy renders all of these items increasingly scarce. Already the pinch is being felt with respect to machinery, equipment and many operating supplies.

There is an immediate need to do something about these things. Regulation 4 already has been issued by NPA. But this regulation is generally recognized as a stop-gap measure. It does not create another pound of steel or any other scarce material. Already an amendment increasing the general quotas is in preparation. The mining industry is recognized by NPA as being in need of special treatment and shortly we will receive, no doubt, preferential increases in quotas and minor capital additions, but no greater priority than is being accorded the peanut vendor or the shoe repairman.

Until some proper system of priorities is installed under a Controlled Materials Plan, all DSFA can do is assist the individual operator in locating sources of supply when he has exhausted all other means of obtaining his requirements. In this, we have had splendid cooperation from NPA and other agencies, both public and private. Such voluntary methods are becoming less and less effective and must be supplanted eventually by controls, if defense requirements are to be met.

Mr. Charles E. Wilson, director, Office of Defense Mobilization, is fully aware of that fact and has stated that as much as he hates the word "controls," there is no other way. In a recent speech in Philadelphia, he said:

"The power of the law must be invoked. It must be used for allocations of materials, for prices, rents and wages—for whatever controls are necessary to prevent inflation, to promote production for defense and provide a fair distribution of commodities among all our citizens. Whatever the causes for delay up to now, we must proceed with courage, speed and forthrightness to adopt the controls which will insure stability and fairness in our civilian economy."

By Defense Mobilization Order 4, issued Jan. 26, 1951, Mr. Wilson directed the defense agencies, including DSFA, to develop programs and issue appropriate regulations for, among other things, allocation of scarce materials and commodities in such manner as to preserve distribution for the most essential purposes. It is part of our job in DSFA to assist the industry in getting necessary supplies at lawful prices. A producer who, after reasonable effort, cannot obtain his requirements at lawful prices should inform DSFA of the full facts of his problem.

Surveys have been made by DSFA of the supply and demand for scarce materials. When these have been fully appraised and analyzed in the light of their availability and the essentiality of their use, we are confident that the solid-fuels industries will obtain their fair share.

The programs of DSFA are divided into two parts—one caring for the immediate needs and the other looking toward the future. To execute these programs effectively, we must obtain current, detailed information and data relating to machinery and materials requirements, production, preparation, transportation facilities, manpower and distribution, the last being broken down by sizes, kinds, qualities, uses and destinations. Such data are most important not only for policy guidance to the administration but also to the industry itself, so that it may do its part in carrying out the defense program. They also are necessary if DSFA is to comply with the mandate of Congress to promote the national defense program and prevent un-

due strains and dislocation in the civilian economy.

We have completed our over-all requirements program covering the needs of the solid-fuels industries for steel, copper, aluminum and other scarce materials and NPA now is making available the necessary allocations of these materials. A similar program has been presented in behalf of the mining-machinery manufacturers, for whom DSFA also acts as joint claimant agency with Defense Minerals Administration. An initial allocation of steel for June, 1951, now is being made. A third program for the benefit of coke-oven operators is being processed and should receive favorable consideration shortly.

The Controlled Materials Plan will become effective July 1. In the meantime, we will endeavor to see that the solid-fuels industries do not lack for needed materials.

A program for serialization of mines also has been set up. For this program operators up to June 30 submitted operating and plant data on DSFA Form 1. These data will be helpful for identification of mines and in setting up procedures for assisting them to procure needed supplies and equipment more readily. DSFA also has issued an order (SFO-2) providing for allocations and diversions at such times as may become necessary.

**MANPOWER**—While inductions into the armed services are beginning to be felt, they have had no serious effect on production as yet. As the draft continues, we hope to be able to act promptly and effectively to prevent any undue effect on the industry's most vital factor—a strong, adequate labor force.

Through the activities of DSFA we have succeeded in keeping coal mining on the list of essential activities in the face of a strong effort to dislodge it because coal was not in short supply. Through this action, mineworkers are retained on the list of critical occupations and consequently are subject to deferment under certain conditions. We also have co-operated in securing delays and deferments for certain key personnel. The Department of Defense has been very receptive to our recommendations in such matters.

**LOANS AND CERTIFICATES OF NECESSITY**—Up to May 23, 1951, DSFA has received a total

of 151 applications for necessity certificates covering accelerated depreciation. The total dollar value of these certificates was \$282,216,531. These, of course, are for new construction only. As of this date, action has been taken on 50 of them, as follows:

Recommended for certification—33, in whole or in part, in the amount of \$84,725,383.

Denied—17, totaling \$6,920,391.

Loan applications received—7, of which one was withdrawn. Of the remaining six, one is in the hands of DPA and five remain with DSFA as of May 23. The six loan applications have an aggregate value of \$16,835,967.

### **Solid Fuel Needs Will Grow**

The vital and strategic importance of solid fuels to the health, economic welfare and security of our Nation is unquestioned. They are the basic elements behind our economic strength, industrial leadership and our defense production program. Many other essential and strategic industries are dependent upon them.

The heavy production schedules ahead of—and already becoming effective in—the mining, mining-machinery, coke, coal-chemicals and related industries to meet both defense and civilian requirements will take a heavy toll of present plants and facilities. If these industries are to meet these increasing requirements, they must obtain the necessary tools, equipment and supplies with the greatest expediency.

Without minimizing in the least the essentiality of programs of other industries, we wish to point out that there is none more basic to the success of the entire defense effort than that of the mining, mining-machinery, coke and coal-chemicals industries. They produce and provide the very materials needed to attain the objectives of these other programs.

While indispensable in the maintenance of a normal economy, solid fuels are even more important in a defense program. Without them, no steel could be produced. Adequate transportation could not be maintained. Sufficient steam and electric power could not be generated. General manufacturing would be paralyzed. The health and safety of the Nation would be endangered. In fact, the entire economy of the country would collapse.

It is just as simple as that.



**1** SUPERINTENDENT TRUAX (right) helps Hugh Haggerty, an old timer acting the part of a new man, prepare his Harwick job application. At this stage, management has its best opportunity to tell what the company offers and what it expects from the new employee.

That First Bewildering Day in the Mine Is the Time for...

## Selling Safety to New Miners

A Newcomer to Harwick Mine Gets a Helping Hand From Management When He Needs it Most—The First Day He Becomes a Safe, Productive Worker in Shortest Possible Time When Initiated by a Competent Official

ABOUT THREE YEARS AGO management of Harwick mine, Duquesne Light Co., the electric utility that serves the Pittsburgh district, adopted the policy of having new employees spend their first day on the property in the company of the safety engineer.



**3** VETERAN EMPLOYEES also take time to show new workers some of the kinks they need.



**4** PRIDE IN SAFETY ACHIEVEMENT, an indication of management's genuine interest, lets Hugh know that "safety comes first."



**2** MAURICE FOWLER (left), safety engineer, assumes the responsibility for Hugh's early training in safe working habits. After showing him changehouse facilities, Mr. Fowler gives Hugh a first-aid kit and explains its use.

This insures the new man a proper orientation into the mysteries of underground mining. That the policy has been rewarded is evident in the fact that not one new employee has suffered a lost-time injury in these three years.

In fact, safety performance at the mine is steadily improving, and J. H. Truax, mine superintendent, feels that some of the improvement is the result of safety-consciousness instilled in all other employees as they see new men receiving such consideration. In 1950, only four lost-time injuries

occurred among 506 employees (451 underground). There were no fatalities. Operating three shifts during the year, Harwick's men produced 752,206 tons in 912,100 man-hr.

Interest in a new employee and the desire to give him the best possible start in coal mining pervade all levels of men and management at Harwick.

Mr. Truax starts the induction process. He helps the newcomer prepare his application, acquaints him with mine law,

outlines mine management and, in a friendly way, presents a picture of what the company offers and what it can rightfully expect from its employees. Then he introduces the new man to Harwick's safety engineer, Maurice Fowler.

Mr. Fowler's office adjoins the first-aid and mine-rescue station, thus giving the new man an opportunity to see the precautions that are taken to safeguard the welfare of the employees. Also, Mr. Fowler gets this opportunity to familiarize the man with the safety record of the mine and to dispel any unwarranted apprehension the man may have acquired. Thus, "scare stories," which the new employee may have heard in other places, can be discounted at the best possible time as far as the new man is concerned. Mr. Fowler presents a first-aid kit and a copy of the Bureau of Mines' Coal Miners' Safety Manual to each new employee. The importance of reporting even the slightest injury is stressed.

A tour of the surface plant follows, and every opportunity is taken to have the new man meet the other employees. Then Mr. Fowler and his protégé go underground. Communications between the shaft and hoisting engineer are explained and operations at the foot of the shaft are described. Here at the foot of the shaft, there is usually more activity than at any other place in the mine. Also, if this is the new man's first experience underground, it is nat-



**5** PROTECTIVE EQUIPMENT, always at hand near hazards, is for Hugh's use when needed, the mine mechanic explains.

**MORE** ➔

## Here's How Harwick Mine Sells Safety to New Miners—Cont'd



**6** AIR-COURSING and the importance of ventilating doors are emphasized to prevent an innocent mistake.



**7** INSIDE AID STATION is described for Hugh. Now he knows material is available and he should learn to use it.



**8** MAJOR HAZARDS—roof falls and haulage—are impressed upon Hugh as he takes his first lesson in roof-testing (left) and learns the safety features of modern mine cars. Note that brakeman gets an extra safety lesson as he listens.



**9** TAUGHT PROPER USE of rerailers, informed of the presence of trolley guards and noting the correct position of the brakeman in the second to last car, Hugh realizes that equipment and safety rules are provided for his benefit.



**10** SAFETY LAMP and its proper use show Hugh what others are doing with unfamiliar equipment.



**11** DESCRIPTION OF EXPLOSIVES MAGAZINE, for one day's supply, impresses Hugh with strict rules to be observed.



**12** MACHINES AND SAFETY—Mr. Fowler describes sensitive antenna that stops loader before operator's clearance vanishes.



**13** F. M. COPRIVNICAR, mine foreman, who will assign Hugh to a job, welcomes him to the Harwick team.

ural that he will be confused, so Mr. Fowler takes plenty of time to permit him to recover from the first shock of encountering this strange underground scene.

A trip through the mine provides an opportunity to explain how coal is mined and transported, how air and other services are conducted through the mine and how to avoid injury from roof falls and haulage equipment. It is granted that the job to which the man will be assigned may require few of the skills pointed out to him on this initial trip, but it is assumed that if he has some idea of what others are doing some of the mystery of mining is removed, and safety is served thereby.

Advantages that accrue from

this program of employee-induction are:

1. The new employee learns that the company is interested in his safety and is trying its level best to make him a member of the team.
2. The company stakes an early claim to some of his loyalty.
3. The man gets a head start toward learning his job, thus making him a productive worker sooner than if he were forced to "muddle through" on his own.
4. The other employees are impressed by the time and effort mine management is willing to put forth to give a new man the proper start. They soon join the spirit of the program and are willing to help orient him.

Harwick's efforts on behalf

of new employees combine the best features of on-the-job training and the man-to-man approach to safety. Nor is the man forgotten after the first day. All supervisors follow up the induction tour to be certain that the new employee is making satisfactory progress, while giving him the answers to any questions that may have occurred to him.

He is encouraged to attend the night mining classes that have become a community institution at Harwick. Further, he is invited to join a first-aid team, and Harwick mine usually enters four teams in the annual first-aid contest of the Allegheny-Kiski Valley Safety Association. The impact of all this effort is having a beneficial effect on Harwick's safety record.

# Simplified Barometric Surveying

You'll Find Barometric Surveying No Longer a Difficult Chore With This Step-by-Step Easy-to-Follow Explanation of the Equipment Required, Equations Employed, Survey Procedure and Calculation of Results

By M. H. HALL, Superintendent of Construction, Olga Coal Co.

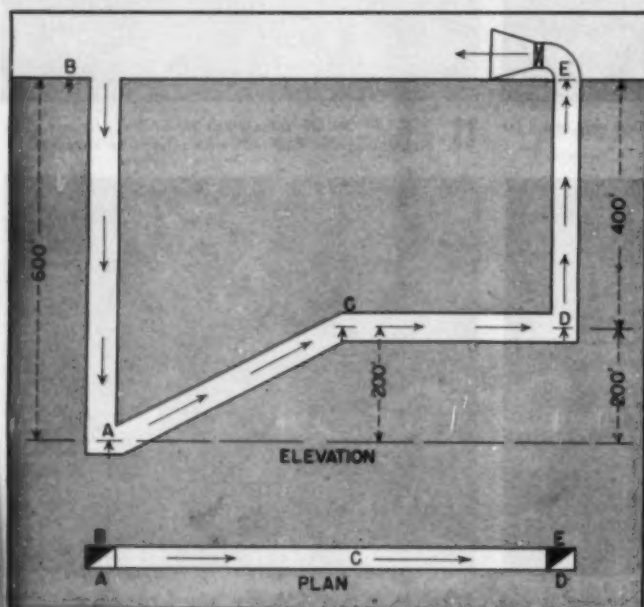


FIG. 1—BAROMETRIC-SURVEY EXAMPLE.

**EQUIPMENT AND DATA SOURCES** required for barometric surveying for control of mine ventilation are as follows:

One mercurial barometer graduated in inches and decimals.

Two precision aneroid barometers reading to 0.001 in. of mercury (American Paulin Co., 1847 S. Flower St., Los Angeles, Calif.)

Two sling psychrometers.

One table showing vapor pressures of water in inches of mercury at different temperatures.

One psychrometer table or chart showing the percentages of saturation of air at various dry- and wet-bulb temperatures.

One tape or 6-ft rule.

One anemometer or pitot tube with differential gage.

• Making a barometric survey includes, in addition to obtaining various instrument readings, as will be detailed later, the solving of certain equations in which the data obtained are substituted. The following data and symbols are used in the equations:

Weight, 1 cu ft water, lb.....	62.4
Sp gr mercury at 32 F.....	13.596
Weight, 1 cu ft air at 32 F and a pressure of 29.92 in. of mercury, lb.	0.0808
Weight, 1 cu ft saturated water vapor, same conditions.....	0.0502
Difference in weight, 1 cu ft dry air and 1 cu ft saturated water vapor, same conditions.....	0.0306
Percentage loss, dry air replaced by saturated water vapor (0.0306 ÷ 0.0808, or 38%).....	0.38
Barometer reading, inches of mercury, Station A.....	HgA

Barometer reading, inches of mercury, Station B.....	HgB
Difference in elevations, Stations A and B, feet.....	H
Vapor pressure water, inches of mercury, Station A.....	VpA
Vapor pressure, inches of mercury, Station B.....	VpB
Percentage of saturation of air at A or B, written as decimal.....	C
Temperature, degrees F, Station A	ta
Temperature, degrees F, Station B	tb

Equation 1:

Total pressure difference, inches of water, between A and B:

$$(HgA - HgB) 13.596$$

Equation 2:

Inches of water to balance the weight of the air column between Stations A and B:

$$(H) 0.1276 [HgA + HgB - 0.38 (VpA \times C_A + VpB \times C_B)] + \left[ 459.4 + \frac{(ta + tb)}{2} \right]$$

When ta and tb each are 62 F, or average mine temperature, Equation 2 becomes Equation 2a:

$$(H) 0.000245 [HgA + HgB - 0.21 (C @ A + C @ B)]$$

The resistance to air flow between A and B is the arithmetical difference between the results of Equations 1 and 2, or Equations 1 and 2a.

Equation 2 is based on the assumption that the weight of a cubic foot of the air column, AB, is a mean value between the weight of a cubic foot of air at A and at B after temperature, pressure, vapor-pressure and percentage-of-humidity corrections have been made to readings at A and B. This assumption is only approximately true, but gives results sufficiently accurate for our purpose. For example, the use of the mean value of the two densities will give a water pressure about 1 in 10,000 high, or an error of 0.00076-in water gage for the 600-ft shaft used as an example in this article.

The practice of making a barometric survey by keeping one barometer at the shaft top or mine opening and making simultaneous readings with another barometer at different places in the mine

requires that temperature and humidity readings be made at several points along the airway connecting the two barometers. The proper adjustment of such readings is quite difficult and, at the best, does not provide very accurate results. The best results will be obtained by taking simultaneous barometer and psychrometer readings at each end of the part of the airway being surveyed. If this procedure is followed, an error or mistake in the survey of one part of an airway will not be reflected in the survey of other parts.

• **Survey Procedure**—Read the mercurial barometer as accurately as possible at a location near the mine and make the corrections prescribed by the manufacturer. Correct the two aneroid barometers to read the same as the mercury barometer when their openings are level with the mercury pool of the mercury barometer. Then take the three barometers to a much-higher then a much-lower elevation and check the aneroids again with the mercury barometer.

If all readings check within reasonable limits, the mercury barometer will have served its purpose. However, the aneroids should be set with the mercury barometer at the beginning of each day's work, and an occasional check should be made at higher and lower elevations to be certain that the aneroids are in good working order.

• **Survey Example**—Let us assume that we are making a ventilation survey of a mine ventilated by an exhaust fan. The intake shaft is 600 ft deep. The return shaft is 400 ft deep and both shafts have the same surface elevation (Fig. 1). Station A is a fixed benchmark at the bottom of the intake shaft. Station B is level with the top of the intake shaft but is sufficiently far away to prevent any movement of the aneroid pointer as a result of air entering the shaft.

The following readings are made simultaneously and tabulated:

	Sta. A	Sta. B
Barometer, in Hg....	28.962	28.426
Difference.....		0.536
Sum.....		57.388
Dry bulb, deg F.....	70	80
Mean.....		75
Wet bulb, deg F.....	65	74
Vp, in Hg.....	0.738	1.029
C.....	0.78	0.76
Elevation, ft.....	800	1,400
Difference.....		600

By Equation 1, the total pressure difference, A to B, in inches of water is:

$$(28.962 - 28.426) 13.596 = 7.287^* \text{ wg}$$

From a table of vapor pressure of water, we find it to be 0.738 in Hg at 70 F and 1.029 at 80 F. From a psychrometric chart or table, we find 0.78 saturation at A and 0.76 saturation at B. The mean dry-bulb temperature is 70 plus 80 divided by 2, or 75 F.

From Equation 2, the water gage is as follows:

$$(600') (0.1276) [28.926^* + 28.426^* - 0.38 (0.738 \times 0.78 + 1.029 \times 0.76)] + \left[ 459.4 + \frac{(70 + 80)}{2}, \text{ or } 534.4 \text{ F} \right] =$$

$$8.148^* \text{ wg}$$

The resistance to the passage of air through the shaft from B to A is 8.148 minus 7.287, or 0.861 in water gage.

Continue the survey from A to C by recording the following simultaneous observations made at A and C:

	Sta. A	Sta. C
Barometer, in Hg....	28.962	28.631
Difference.....		0.331
Sum.....		57.593
Dry bulb, deg F.....	70	62
Mean.....		66
Wet bulb, deg F.....	65	60
Vp, in Hg.....	0.738	0.560
C.....	0.78	0.90
Elevation, ft.....	800	1,000
Difference.....		200

By Equation 1, the pressure difference, A to C, in inches of water, is:

$$(28.962 - 28.631) 13.596 = 4.500^* \text{ wg}$$

Vapor pressures, humidities and mean temperature are obtained as previously recounted. The difference in elevation is 200 ft.

From Equation 2, the water gage is as follows:

$$(200') (0.1276) [28.962^* + 28.631^* - 0.38 (0.738 \times 0.78 + 0.560 \times 0.90)] + \left[ 459.4 + \frac{(70 + 62)}{2}, \text{ or } 525.4 \text{ F} \right] =$$

$$2.778^* \text{ wg}$$

The resistance to air flow from A to C is 4.500 minus 2.778, or 1.722 in water gage.

Continue the survey from C to D by recording the following observations made at C and D:

	Sta. C	Sta. D
Barometer, in Hg....	28.631	28.421
Difference.....		0.210
Dry bulb, deg F.....	62	62
Wet bulb, deg F.....	60	62
Vp, in Hg.....	0.560	0.560
C.....	0.90	1.00
Elevation, ft.....	1,000	1,000
Difference.....		0

By Equation 1, the pressure difference, C to D, in inches of water, is:

$$(28.631^* - 28.421^*) 13.596 = 2.855^* \text{ wg}$$

This is the resistance to air flow from C to D since both stations have the same elevation. The weight of the air column given by Equation 2 is zero.

Continue the survey up the return shaft by recording the following observations:

	Sta. D	Sta. E
Barometer, in Hg....	28.421	27.971
Difference.....		0.450
Sum.....		56.392
Dry bulb, deg F.....	62	62
Wet bulb, deg F.....	62	62
Vp, in Hg.....	0.560	0.560
C.....	1.00	1.00
Elevation, ft.....	1,000	1,400
Difference.....		400

By Equation 1, the pressure difference, D to E, in inches of water, is:

$$(28.421^* - 27.971^*) 13.596 = 6.118^* \text{ wg}$$

The shaft is 400 ft deep. The air is 100% saturated. Since both the dry- and wet-bulb temperatures at C and D are 62 F, use Equation 2a:

$$(400') (0.000245) [28.421^* + 27.971^* - 0.21 (1 + 1)] = 5.485^* \text{ wg}$$

The resistance to air flow from D to E is 6.118 minus 5.485, or 0.633 in water gage.

Summarizing, we have the following:

Resistance, B to A.....	0.861^* wg
Resistance, A to C.....	1.722
Resistance, C to D.....	2.855
Resistance, D to E.....	0.633
Total, B to E.....	6.071^* wg

The total resistance should check very closely with the fan water gage. All elevations should be determined very accurately since an error of 1 ft in the height of the air column will result in an error of about 0.013 in of water gage, depending, of course, on the barometric pressure and the temperature of the air column.

## Bulldozers Prove Effectiveness in Stripping Overburden up to 55 Ft Deep



**STRIPPING** in a 40-ft bank, with the bulldozers working down to the lip of the highwall and then pushing across the spoil area. Because of conditions in this particular pit, spoiling is being done on an angle instead of straight across.



**GENERAL VIEW** of pit being completed in April, showing smoothly sloped spoil area at the left and highwall receiving final cut at the right.



**IN THIS EARLIER PIT**, where the maximum depth worked was 50 to 55 ft, the spoil has been laid out in typical 30-deg-slope fashion to the right, while the top of the highwall shows the usual slope resulting from pushing down preliminary to spoiling across the pit. The bulldozers and shovel together trimmed the toe of the highwall to make it vertical and uncover the maximum tonnage of coal.



APPROXIMATELY 20 cu yd of rock headed downhill for the old pit. Maximum that can be rolled downhill is estimated at 25 cu yd.



PUSHING UP as much as 30 deg, the bulldozers can roll up to 9 cu yd, compared to 20 to 25 cu yd when traveling downhill.

## Bulldozer Stripping

WHAT E. W. Kennedy Experience Shows on Principles  
and Organization for Bulldozer Operation

HOW Stripping Is Done to Take Maximum Advantage of  
Equipment Characteristics and Capacity

**BULLDOZERS**, as a result of the increased power and speed provided by modern equipment, have proved themselves versatile, capable and efficient stripping tools for E. W. Kennedy, of Boonville, Ind. Occasionally operating in overburden up to 50 to 55 ft, though the normal maximum is 35, three such units can uncover over 10,000 tons per month where the average coal thickness is 5 ft. Loading an average of three days and stripping five (two shifts each), the minimum seldom is less than 7,000 to 8,000 tons.

This production is achieved by a pit crew of nine men, as follows: dozer men, Bill Brown, Mel Hart, Conrad Autry and James Gill; driller and shooter, Garrett Dosma; shovel operator, Jack Woodruff; oiler, Erskine Asher; coal pickers, Forrest Davidson and Elmer Will. The coal is sold after picking as mine run. To facilitate both picking and truck loading, a special "tipple" (hopper and belt) is used between the shovel and the trucks. Hauling to the consumer is

contracted by Albert Ashley, also of Boonville.

The bulldozer equipment out of which the present operation has evolved was acquired for general contract work. This, however, was subject to the usual winter recession and, to keep the equipment employed, it was decided to experiment with stripping. The start was made in the fall of 1948. The idea that good men, plus modern bulldozer equipment, could make a go of it proved out, leading to the present set-up.

● **Equipment Rollcall**—The Kennedy bulldozer layout is practically identical with the conventional stripping set-up, except that bulldozers are substituted for the conventional shovel or dragline. Thus, the list of equipment now in service includes the following:

Three Allis-Chalmers HD 19 tractors with Baker bulldozers, purchased through Flesch-Miller, Indianapolis, Ind. The tractors are equipped with Model 671 General Motors diesel engines and also

with Twin Disc torque converters.

One HD 5 tractor with 1-yd Tractomotive loader—used for coal cleaning, road building and maintenance, and other miscellaneous dirt moving.

One Parmanco sidewall drill with manual feed.

One Hardscog "Coal Popper" coal drill.

One Bay City Model 59 1-yd loading shovel with G.M. No. 471 diesel engine.

One Chicago Pneumatic air compressor for drilling cap rock and other use as necessary.

One 4- and one 3-in Jaeger pumps.

One picking and truck-loading unit, built at the mine and using a Northern elevator with 24-in belt.

### ● Normal Stripping Depth 35 Ft

—With this equipment areas so far worked have ranged from 3 to 16 acres in size. Normally, as previously noted, the maximum stripping depth is 35 ft, and the areas represent largely pieces of coal left after previous deep or strip mining, or both. Selection of the areas to be stripped is largely a matter of studying the surface along the outcrop and checking whether it shows caving from old deep mining. More elaborate prospecting is ruled out by the smallness of the acreages available for stripping in an area that has been



**PREPARATION FOR LOADING** includes cleaning the top of the coal with tractor loader, followed by hand shoveling. Then the coal is drilled and shot.



**PICKING IS FACILITATED** and truck loading is speeded by this portable tippie, consisting of a skid-mounted hopper feeding to a belt-type elevating conveyor.

rather intensively mined, or where the larger blocks are held by the larger producers.

The terrain is largely one of low hills and stripping, therefore, of necessity, is largely of the outcrop variety. Pit length usually is short and water from old deep mines, in addition to surface drainage, is a frequent occurrence. No attempt is made to strip areas that have been previously deep-mined, both because of the added difficulty and expense and the reduced yield of coal per yard of overburden moved.

• **How Stripping Is Done**—Stripping, as far as possible, is based on pushing directly across the pit or outcrop to the spoil area. When the first cut is opened along the outcrop, the coal is loaded out completely. Then, on the second and succeeding cuts, the bulldozers start pushing directly into the pit, sloping the lip of the highwall as shown in the accompanying illustrations. When the pit is filled sufficiently, the bulldozers start

pushing across to the main spoil area, carrying the spoil out as far as necessary for disposal.

Stated in another way, the stripping process is essentially one of cutting down the lip of the highwall, traveling more or less level across the pit and then pushing up on the spoil pile to the point of disposal. As the highwall is cut deeper and deeper, some of the spoil originally pushed into the pit is rehandled. The quantity is estimated at not over 20%.

To complete the stripping job and establish the new highwall, the bulldozers may angle along it before changing direction to move the spoil to the final disposal point. In addition, the loading shovel may be called in for final trimming, although this results in a ridge along the toe of the spoil area which may interfere with the dozers in getting the next cut started, unless flattened in a separate operation.

Completion of the cut, therefore, normally leaves a vertical high-

wall as far up as the hard rock extends, with the top angled back around 30 deg. Across the coal the spoil also is angled up about 30 deg in a smooth slope, with possibly a toe of clean-up spoil at the edge of the coal.

• **Hard Material Shot Before Stripping**—When hard material is encountered—as is usually the case—it is drilled horizontally and shot with Austin 40% gelatin in 3x16-in sticks, set off by Austin detonating fuse. Holes are drilled on 18- to 20-ft centers, and the usual loading is 100 lb per hole. Yield per pound of explosive is estimated at 7 to 8 cu yd, including the softer surface material. Where a hard layer, or cap rock, is encountered above the seam, and is high enough and hard enough so that it is not well broken by horizontal shooting, it is drilled and shot with short vertical holes.

The bulldozers have experienced no unusual difficulty in handling the rock as long as it is broken up enough so that they can get hold of it. When pushing downhill on the highwall, the dozers, with blades 4 ft high and 11 ft wide, can roll up to 20 to 25 cu yd. When pushing up on the spoil, they can roll up to 9 cu yd without difficulty. With good operators—and Mr. Kennedy considers the best of men the key to the success of an operation of this type—the dozers, therefore, can move large volumes of burden at an economical cost.

• **Portable Tippie Facilitates Cleaning and Loading**—The coal normally is shot before loading with Austin Red Diamond gelatin-type permissible. To permit picking and speed up loading, a special portable tippie is used behind the loading shovel. The Northern belt-type elevating conveyor is fed by a hopper resting on skids and equipped with a hitch permitting the entire unit to be dragged along by the loading shovel.

Capacity of the hopper is approximately 5 cu yd or five dipper-loads. The loading shovel is aided because the hopper can be placed where the shortest swing can be used and, in addition, compared to loading directly into trucks, the hopper always is in the same position and at the same height, thus eliminating jockeying to find the right spot for dumping.

As the coal feeds out of the hopper onto the belt, it is picked by two men, one on each side, and then goes into the trucks for delivery directly to the consumer.

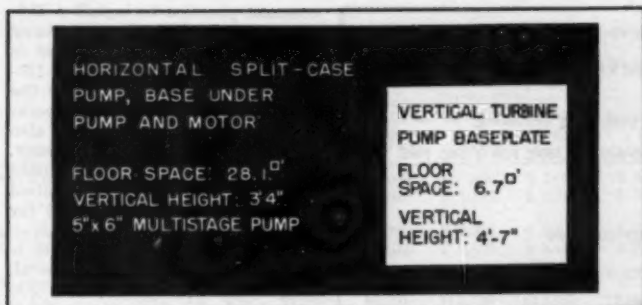


FIG. 1—HOW FLOOR-SPACE REQUIREMENTS of horizontal split-case and deepwell-turbine pumps of the same head and capacity compare.

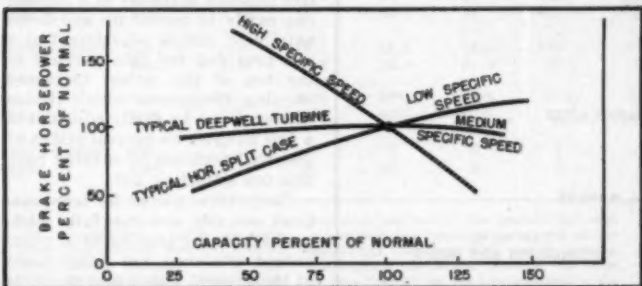


FIG. 2—FLATTER HORSEPOWER CURVE of deepwell-turbine pumps resulting from higher specific speeds provides definite operating advantages.

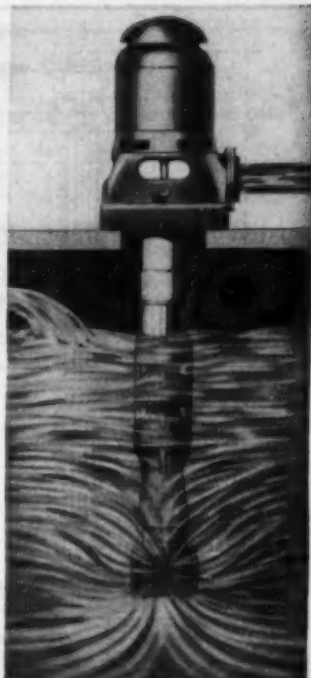


FIG. 3—CLOSE-COUPLED VERTICAL TURBINE typical of underground pumping.

# Deepwell-Turbine Pumping

## What Vertical-Turbine Units for Mine Use Offer in the Way of Lower Installation and Operating Costs

By R. D. NORTON, Branch Manager,  
Harris Pump & Supply Co., Charleston, W. Va.

WHICH IS MORE ECONOMICAL for main-station dewatering, the vertical-turbine or the horizontal split-case pump? This is the question being debated by many mines today on new or replacement installations. The deepwell-turbine pump is newer in the field but is rapidly out-distancing the horizontal split-case pump. The author represents a manufacturer of both vertical and horizontal pumps. An article will be made in this article to compare the two on an impartial basis.

The deepwell-turbine pump, which was developed primarily in California for irrigation purposes,

can be used to advantage in several types of mine installations. The pump element can be placed in a sump with motor at the surface and necessary connecting shaft and column in the borehole. A similar arrangement may be used in an abandoned shaft, or the pump may be close-coupled and installed as a sump pump in an underground station (Fig. 3). Sometimes a close-coupled pump can be located in a vertical position on the side of the shaft to collect shaft seepage, or the pump may be arranged portably and used as a sinker-type unit. This article will develop the following

advantages of the deepwell-turbine pump over the horizontal split-case pump:

1. Much less floor space is required in an underground station (Fig. 1).
2. No priming equipment is needed for the turbine-type pump since the pump element is submerged.
3. In many instances, turbine pumps use smaller motors, since the horsepower curve is flatter, as a result of higher-design specific speed (Fig. 2).
4. As abrasive wear occurs, the turbine-type pump can be easily adjusted to reduce wearing clearances in the pump bowls without disassembling.
5. Additional advantages where the deepwell turbine is installed with the motor on the surface are: (a) pump operation is easily and completely controlled from the

## Deepwell-Turbine Units Offer Many Advantages in Mine Application

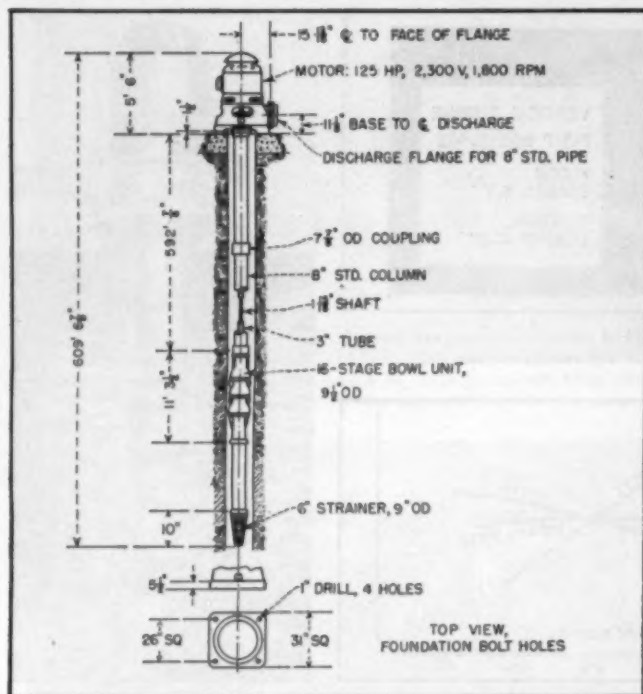


FIG. 4—VERTICAL TURBINE INSTALLATION for depth in excess of 600 ft—560 gpm at 600-ft total head, 1,770 rpm, 118.3 hp required.

surface; (b) the explosion hazards of an additional motor below-ground are eliminated; (c) control of the pump from ground level facilitates operation after the normal day shift on an "off-peak-load" basis. Power costs are thereby decreased.

### Lower Installation Cost

As a rule, only one-fourth to one-third as much floor space is required for the vertical-turbine pump as compared to the horizontal centrifugal type. This means a large saving in excavation and construction cost for the mine-pumping station. Fig. 1 compares the space requirements of the two types of pumps on the basis of examples having the same head and capacity, chosen at random. Because the pumping element of the turbine unit is submerged in the sump, the only station floor space needed is sufficient room to accommodate the bottom-ring base of the vertical motor, and to provide a general combination pump-discharge connection and general support for hanging the pump.

No auxiliary priming equipment need be installed for the turbine because its pumping element is submerged at all times.

### Lower Power Costs

**Higher Motor Efficiency**—The vertical-turbine pump is a higher specific-speed pump than the horizontal centrifugal. Fig. 2 shows typical horsepower-curve characteristics for various specific speed. Note that the specific speed of the typical turbine pump results in a curve that is relatively flat. This enables the turbine pump to handle a wide range of heads and capacities at an almost constant horsepower, whereas the typical horizontal-pump horsepower curve varies considerably throughout reasonable head ranges.

Conservative engineering practice often requires that the motor size be ample for any possible operating head and particularly so with some types of large dewatering stations where the head may change appreciably during the pumping-out cycle. It is, therefore,

common practice to install a 150-hp motor on a horizontal pump motor where the design load is only 110 hp, and where only a 125-hp motor would be used for the equivalent turbine pump. Operation closer to full-load rating also results in higher motor efficiency. Consequently, less kilowatt hours are used and less total installed horsepower is often required for the vertical turbine pump.

**Sustained Efficiency**—In general, a horizontal pump must be disassembled and the wear rings replaced to bring pump efficiency back to normal after several years of operation. In contrast, the entire impeller assembly of a turbine can easily be moved up and down axially by simple adjustment of a nut provided for this purpose in the top of the motor. Increased running clearances which reduce efficiency can be easily adjusted in a few minutes on several makes of deepwell turbines by turning back this top adjusting nut.

Competitive pumps for large stations usually are carefully compared from the standpoint of guaranteed efficiency, but pump users at the present time place too little emphasis on "sustained efficiency." The importance of sustained efficiency cannot be stressed too strongly for mine-dewatering stations, where silt and abrasive particles result in a rapid increase in running clearance past the wear rings.

**Higher Pump Efficiency**—It cannot be stated positively that either type of pump is more efficient than the other. However, Fig. 2 and the author's experience show the deepwell turbine to be generally more efficient in the more usual coal-field applications.

**Other Advantages of Motor on the Surface**—Where a borehole is practical and the top of the hole can be located in a reasonably accessible position the motor and control equipment are installed at ground level. The pump element is submerged in the sump below the surface, and the water discharges vertically through the column pipe, which serves both as a discharge pipe and as a supporting pipe for the driving shaft between motor and pump element (Fig. 4). This type of construction offers many advantages.

Since the pump is completely controlled from the surface, inspection by a fireboss inside the mine is not required. Where the

## How Horizontal and Vertical-Turbine Pumps Compare

		1,750 RPM								3,500 RPM	
		100 GPM	200 GPM	300 GPM	400 GPM	800 GPM	1,000 GPM	1,500 GPM	200 GPM	400 GPM	
		100' TH	200' TH	300' TH	400' TH	400' TH	300' TH	400' TH	200' TH	400' TH	
Initial Cost (A)	Hor.	\$ 250	\$ 570	\$ 630	\$ 840	\$ 1,090	\$ 1,090	\$ 1,500	\$ 310	\$ 580	
	Vert.	\$ 350	\$ 655	\$ 926	\$ 1,100	\$ 1,400	\$ 1,150	\$ 1,690	\$ 418	\$ 763	
Yearly Pumping Cost (B)	Hor.	\$ 160	\$ 418	\$1,200	\$ 2,050	\$ 3,670	\$ 3,310	\$ 6,600	\$ 577	\$ 2,018	
	Vert.	\$ 122	\$ 467	\$1,015	\$ 2,130	\$ 3,490	\$ 3,200	\$ 6,260	\$ 497	\$ 1,805	
Initial Plus 5 Yr Cost	Hor.	\$1,050	\$3,885	\$6,530	\$11,090	\$19,440	\$17,640	\$34,500	\$3,195	\$10,670	
	Vert.	\$ 960	\$2,990	\$6,001	\$11,750	\$18,850	\$17,150	\$32,990	\$2,803	\$ 9,788	
Recommended Motor Size (C)	Hor.	7½	20	40	100	125	100	200	20	60	
	Vert.	3	15	30	75	100	100	200	15	60	
Peak Horsepower (C)	Hor.	6.6	19.3	44	90	130	95	215	17.5	57	
	Vert.	3.32	14	28.9	71	101	91.7	187	13.6	61.5	
Load Horsepower	Hor.	4.28	18.1	33.5	58.6	105	94.6	191	15.8	57	
	Vert.	3.24	12.8	28.4	60.3	99.6	91.4	181	13.6	50.5	
Pump Load Efficiency	Hor.	59%	56%	68%	69%	77%	80%	79%	64%	71%	
	Vert.	78%	79%	80%	67%	81%	83%	84%	74%	80%	
Number Impeller Stages	Hor.	1	2	2	2	2	2	2	1	2	
	Vert.	8	8	10	3	9	6	11	3	4	

A. Prices based on those in effect Nov. 1, 1950. For horizontal pumps, initial cost represents pump complete with base and coupling but without motor. Consumer cost is f.o.b. factory. For deepwell turbines, initial cost includes pump assembly, discharge head, and pump-to-head adapter, all f.o.b. factory with freight allowed to destination. In addition to this freight-free advantage, the deepwell-turbine unit can be set in a sump with a strainer as the only additional cost item in most instances. The horizontal pump usually will require suction pipe, elbows, fittings, foot valves, strainer and some sort of priming device. The cost of these extra items is appreciable on the larger pumps. This major advantage of the vertical-turbine over the horizontal pump should be kept in mind in comparing the two types of pumps on an initial-cost basis in the above tabulation. However, initial costs have been

compared "less motor." The standard horizontal motors used with horizontal pumps will be less costly than those used with vertical turbines. Summarizing all factors, however, the total of price "extras" for one type compared to the other generally reflects a lower total additional cost for the vertical turbine pump.

B. Based on pumping 8 hr per day 365 days per year for 10 yr at 1½¢ per kWh, assuming the following motor efficiencies: 3-5 hp, 85%; 10-25 hp, 87%; 25-50 hp, 89%; 75-100 hp, 91%; 150-200 hp, 92%.

C. Peak horsepowers shown are maximum possible pump-horsepower loadings under any head condition. It is often engineering practice to size the motor on the basis of this maximum loading rather than the horsepower required at the operating-condition point only.

Many large industrial users size their motors to allow no more than 10% overload at the peak-horsepower point on the curve, and this practice has been followed in the comparisons in the above tabulation.

General Note—It is of course recognized that many of the selections listed could be improved upon by some manufacturers as a result of their impeller designs better fitting the head and capacity conditions established in this chart for representative comparison. For comparison purposes, however, arbitrary heads and capacities have been chosen and one manufacturer well known in both the horizontal and vertical fields has been selected to quote under all conditions. Efficiency improvements could have been made by using end-suction horizontal pumps for the smaller capacities, but for uniformity the commonly accepted horizontal-split-case pump has been used throughout.

pump must be operated on week ends, this results in large savings each year. There is also a reduction in the explosion hazard when the motor is on the surface. As an example, a West Virginia company with a major gas condition is installing four 125-hp deepwell turbines for this reason.

The shaft lengths for three of these pumps are in excess of 600 ft. (Fig. 4). These pumps will start by time clock and will stop automatically when the pump-down cycle is completed. If used in the evening hours, they also can effect a saving by operating at an "off-peak" period, thereby reducing the total company's maximum demand rate.

A second West Virginia company has installed a single dewatering station of the turbine type rated at 15,000 gpm. This sta-

tion is started up after the day shift and runs for several hours. The power saving on this one installation, operating during off-peak periods, compared to equivalent pumping, if required during the regular day shift from a below-ground station, has been roughly estimated by the company's electrical department at \$10,000 per year.

With motors on the surface, inspection and maintenance of motors and control are more easily effected, and the ever-present worry about motor and control damage through flooding of the pump station belowground is eliminated.

A further advantage possible with the vertical-shaft turbine pump installation is using the water, discharged vertically to the surface, for a mine-pressure sys-

tem. Greater emphasis is being placed each year on dust-allaying systems. In drift mines spray nozzles generally require far more pressure than is necessary to carry water from dewatering points to the nearest exit locations.

If a vertical-turbine pump were installed to lift the water vertically through a borehole to ground level, the head resulting from the difference in elevation between the mine workings and the surface would be sufficient in most instances to provide adequate pressure at the spray nozzles. The piping system could operate from an open reservoir at ground level in similar fashion to an elevated tank on a hillside serving a town-water system. This advantage would apply, of course, only if discharge vertically from the main pumping station was practical.

# Laboratory Research Points the Way to New Considerations in . . .

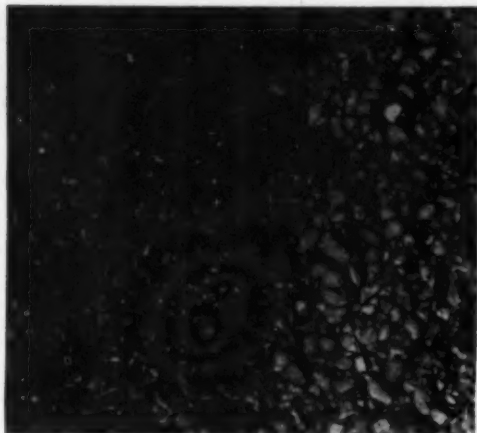


FIG. 1—APPEARANCE of treated coal (right) compared with untreated coal after 90 days' outdoor storage.

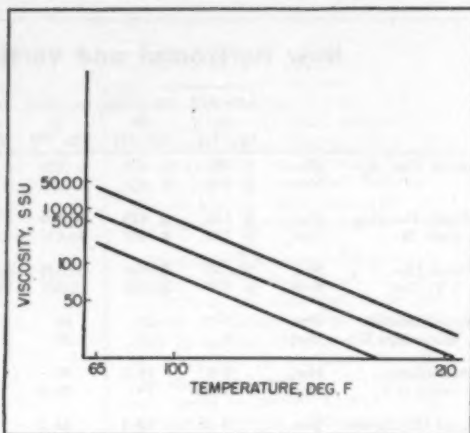
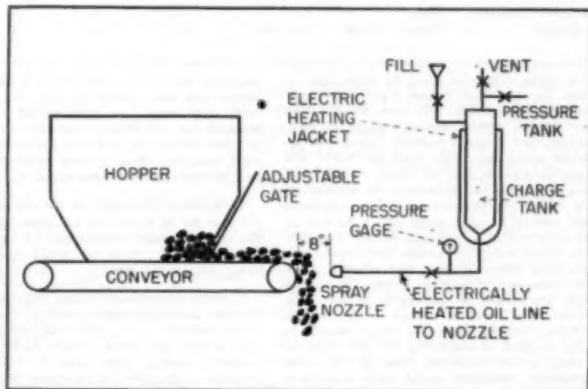
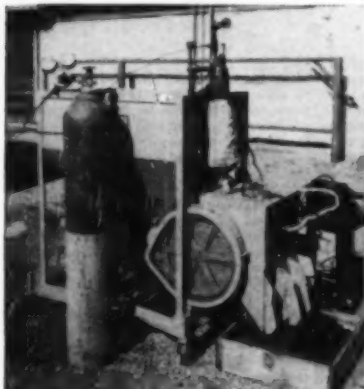
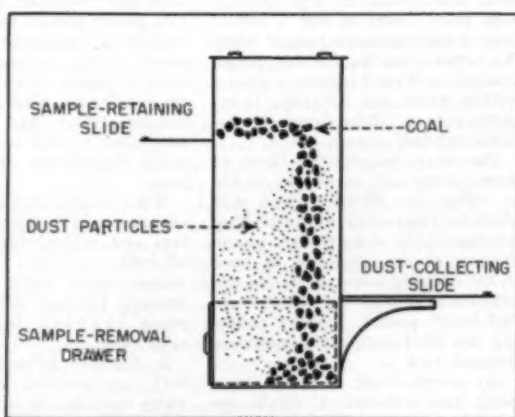


FIG. 2—VISCOSITY CURVES for typical coal-dedusting oils, showing effects of heat.



FIGS. 3 and 4—COAL-TREATING apparatus used in laboratory evaluation procedure and at right the unit in schematic form, showing components and operation.



FIGS. 5 and 6—ASTM APPARATUS for measuring dust indices.

# Dustproofing With Oil

Proven Dedusting Base With Variations in Diluent Provide Equal Dedusting Results in Spite of Variable Viscosity Requirements—Optimum Dosage More a Function of Surface Area Than Coal Weight

By G. A. MARTIN and R. W. CLOYD

Wood River Research Laboratory, Shell Oil Co., Inc., Wood River, Ill.

TREATING OILS, as pointed out by G. W. Waters in discussing the theory and practice of oil treatment of coal in the November, 1948, issue of *Coal Age*, are believed to accomplish their primary function of suppressing the dust formed in routine handling in several ways. One is by making the already-formed dust adhere to the larger coal pieces. Another is by reducing moisture loss and surface oxidation, thus reducing friability. All this is accomplished by the formation of a continuous oil-film barrier on the surface of the coal.

Thus, in the production and maintenance of such an oil-film barrier, the viscosity of the treating oil becomes very important. A nonviscous oil would be desirable during application of the film, whereas a viscous oil would provide a tough barrier with sufficient mechanical strength to prevent surface oxidation and moisture loss.

Viscosity requirements can be adequately met by using a viscous oil heated to reduce its viscosity for application. However, since all mines do not have equal heating facilities for reducing viscosity, oils of different viscosities and pour points must be provided. Again, where mines are without facilities for handling viscous oils, the less-viscous oils that must be used leave an oil film on the coal that is less-tenacious than that of a more-viscous product. Fig. 2 clearly demonstrates this point. One mine, with facilities for heating the oil to only 140 F will wind up with a less-viscous film on the coal at storage temperature than another that can heat to 180 F,

assuming both apply dedusting oils at the same viscosity.

• What Research Shows—These

theoretical considerations, along with practical experience, are probably behind the widely held opinion in coal-treating circles that the viscosity of an oil is critical in dust suppression, and that the most viscous oil that can be handled by available heating facilities is the most effective.

The preceding may hold true for many treating oils but not necessarily for all. Research has shown that a very effective dedusting formulation is available whose general application need not be limited by the variable viscosity requirements of different mines.

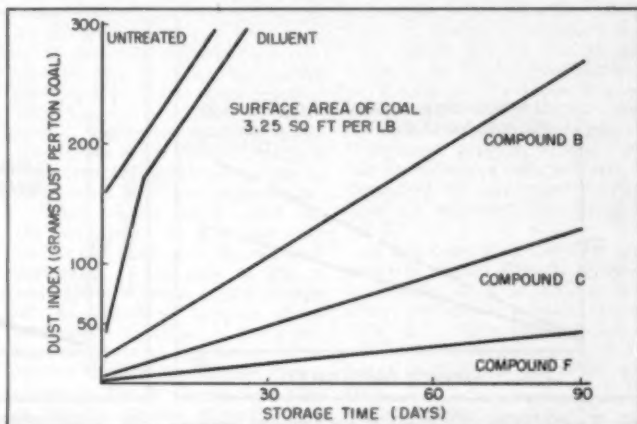


FIG. 7—DEDUSTING EFFICIENCY of treating oils applied at 5 qt per ton.

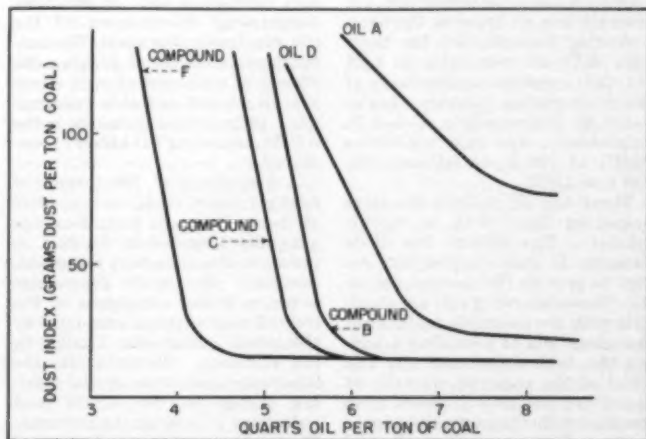


FIG. 8—EFFECT OF DOSAGE on dedusting efficiency after 30 days' storage.

Adapted from a paper entitled "Technical Considerations in the Application of Coal-Dedusting Compounds," presented at a meeting of the Illinois Society of Coal Preparation Engineers and Chemists.

## Effective Oil Dedusting Possible Independently of Initial Viscosity

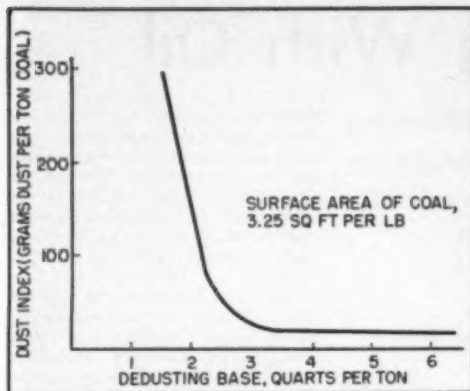


FIG. 9—VARIATION IN DUST INDEX with quantity of dedusting base applied after 30 days' storage.

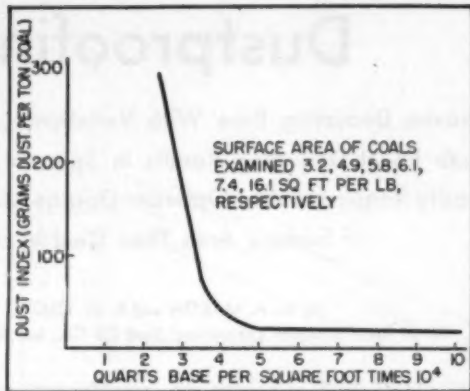


FIG. 10—VARIATION IN DUST INDEX with quantity of dedusting base applied after 30 days' storage.

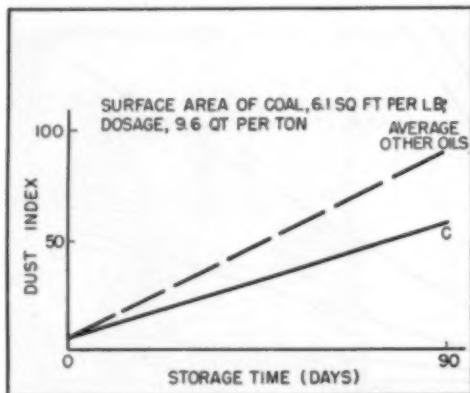


FIG. 12—DEDUSTING EFFICIENCY of one compound compared to competitive oils in the 500-750-viscosity range, 100 F.

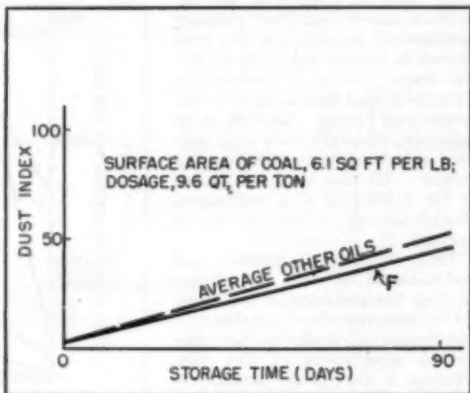


FIG. 13—DEDUSTING EFFICIENCY of one compound compared to competitive oils in the 2,000-plus-viscosity range, 100 F.

Three available dedusting oils, for example, are all based on the same dedusting formula, but the three have different viscosities to meet the most common requirements of the coal-treating industry. Designated as Compounds B, C and F, respectively, they have viscosities (SSU) at 100 F, as follows: 250, 750 and 2,500.

These oils all contain the same dedusting base with a specific diluent. The diluent has little function in dust suppression, except to provide the desired viscosity. Thus, dedusting oils are available with the desirable features of spreading and of providing a lasting film, both in the same oils. The effect of the required viscosity of the oil is completely divorced from the final dedusting effectiveness.

• **What Laboratory Tests Reveal**—The laboratory provides some

very interesting data on the dust-suppressing effectiveness of the oils previously discussed. The conventional methods of judging the efficacy of treatment at most mines are visual and palpable examination. Only in rare instances is the ASTM procedure (D-547-39T) employed.

A dust index of 100 (grams of dust per ton of coal), or less, after 10 days' storage of treated coal is generally accepted in the field as the mark of satisfactory treatment. Certainly the most dependable criterion is the acceptance of the treated coal without complaint by the retail dealer and, finally, by the customer. However, for the laboratory evaluation of coal-treating efficiencies, the ASTM dust index was chosen as the criterion. The coals used were untreated Illinois No. 6 bed, No. 10 stoker.

The equipment used in laboratory treatment consisted of a 450-lb-capacity Viking hopper conveyor with an adjustable gate to control the flow of coal and a pressure spray system equipped with electric heaters. This equipment is shown photographically in Fig. 3 and diagrammatically in Fig. 4 on the first page of this article.

The spray nozzles, which delivered a flat spray through a 0.031-in orifice, were calibrated with oils of 100-SSU viscosity at various pressures (50 to 100 psi) to permit delivery of known quantities of oil at given pressures. Thus the dosage of the oil applied to the coal was determined by adjustment of the spray (pressured by a nitrogen tank), and the rate at which the coal was delivered on the constant-speed conveyor through the adjustable gate.

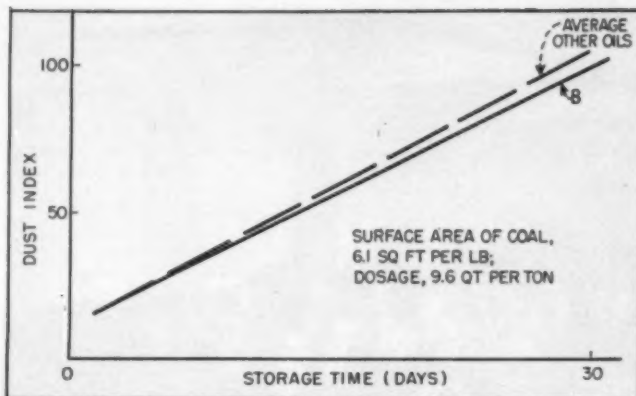


FIG. 11—DEDUSTING EFFICIENCY of one compound compared to the average of competitive oils in the 85-100-viscosity range, 100 F.

The treating procedure consisted merely of applying oil, at a predetermined pressure and at the temperature at which the viscosity was 100 SSU, to the coal as it was tumbled at a fixed rate from the conveyor belt into a collecting duct. The same procedure was used in treating both the wet and dry coal. All treated coal samples (50-lb) were permitted to weather outdoors. Then the dust formed after 1, 10, 30, 60 and 90 days was measured, and the dust index in grams of dust per ton of coal was recorded.

Fig. 6 is a schematic diagram of the ASTM apparatus used in determining dust indices; Fig. 5 is a photograph. The procedure consisted of dropping a 50-lb sample 4 ft from the upper side of the apparatus into the drawer in the bottom. The suspended dust that collected in 10 min on the lower slide was weighed and the dust index calculated on the basis of a ton of coal.

**• Comparative Treating Efficiencies**—Fig. 7 illustrates the comparative treating efficiencies of the three dedusting oils under discussion. This figure also shows the dedusting ineffectiveness of the diluent used in coal-dedusting oils to reduce viscosity. The three dedusting oils proved effective at a dosage of 5 qt per ton, although in varying degrees. The rate of dust formation of an untreated coal is given for comparison.

The effect of increasing the oil dosage on the dedusting efficiency of Compounds B, C and F is shown in Fig. 8. All three, as noted, have a common dedusting base. Thus, their action is similar within the range of effective application.

Moreover, Fig. 8 shows that maximum dust suppression is effected by an optimum dosage with B, C or F, and that application in excess of this quantity is wasted. Examination of two other treating oils (A and D), available commercially, indicates that optimum treatments with these require a considerably higher oil dosage to effect even less dust suppression.

These results again point out the importance of a lasting film on the coal surface to repress dust formation. If the data in Fig. 8 were given in terms of the dosage of the dedusting base in these compounds to effect a given dedusting efficiency, the three curves resolve themselves into one curve, shown in Fig. 9. These data are, of course, further evidence that the effectiveness of an adequate dedusting base is not lost by dilution if the proper type of diluent is chosen.

In the course of the work on coal-dedusting compounds it was observed that the only sound basis for comparing the effect of dedusting oils on various coals was by using the surface area of the coals as a base. The recommended association between oil dosage and surface area was discussed by Waters in the November, 1948, issue of *Coal Age*. To sum up, a straight-line relationship between the surface area per pound of coal and the quantity of dedusting oil required to obtain a predetermined degree of dust suppression, measured by dust index, has been observed.

Fig. 10 shows the results of the study of the effect on the dust index of the quantity of dedusting base in Dedusting Compounds B,

C and F, applied per square foot of coal. This relationship was established with coals of 3.2, 4.9, 5.8, 6.1, 7.4 and 16.1 sq ft per lb, respectively—Indiana as well as Illinois coals. Thus, consideration should be given not only to the quality of the treating oil applied but also to the quantitative relationships, where available, in describing optimum treating dosages. Moreover, the importance of surface area should not be overlooked when efforts are being made to effect economical treatment of coal, with assurance that it will be adequate and the coal free from customer complaint.

Figs. 11, 12 and 13 compare the dedusting efficiencies of the Compounds B, C and F and the average efficiency of a number of other oils falling in the same viscosity ranges. All treats were made at the same oil dosage. The advantage of Dedusting Compound B over other oils is not as pronounced as that of Compounds C or F because the latter two are being applied at nearer their optimum dosages. However, the differences between B and other oils in dedusting efficiency can be magnified by increasing the dosages to approach the optimum for B.

It has been observed that coal properly treated with effective oils invariably show a grayish film after prolonged outdoor storage (Fig. 2). This grayish film is attributed to the adherence of airborne particles to the tacky surface.

**• Conclusions**—It may be concluded that no mine need suffer from inadequate coal-dedusting treatment simply because heating facilities are not available for handling high-viscosity dedusting oils. Popular opinion has held that the highest-viscosity oil that can be handled is the most efficient in suppressing coal dust. However, there are oils available that provide excellent dust-suppression efficiency independently of their initial viscosity, since the efficiency results from the presence of a proven "dedusting base," while the viscosity of the oil applied is determined by the quantity of diluent added. For these oils the same level of maximum coal-dedusting efficiency is achieved by the application of an optimum oil dosage. This optimum dosage can be calculated readily and has been found to be related more appropriately to the surface area of the coal rather than the weight.

## Here's How P&R Helps Supervisors Profit From Company Meetings



REALIZING MAXIMUM VALUE from supervisory meetings, P&R experience indicates, includes early-evening schedule, a social hour and illustrated talks or motion pictures. Here, H. A. Schreengost, USBM, speaks briefly before a movie on haulage safety.

# Making Meetings Pay

**What Philadelphia & Reading Has Learned About Getting Results From Supervisory Meetings, Including:**  
**Meeting Time and Frequency . . . Who Should Attend**  
**Value of the Social Hour . . . Presenting the Material**  
**Finding Out What the Men Need in Their Daily Work**

By EDWARD A. LYNCH, Director of Personnel  
Philadelphia & Reading Coal & Iron Co., Pottsville, Pa.

MAN'S THIRST FOR KNOWLEDGE does not necessarily mean that he will go out of his way to accept anything bearing the education label regardless of its quality or the manner in which it is presented. This applies especially to the training of supervisory personnel in industry.

Industry, by and large, is doing a good job of training its supervisory men and women. The success which attends such training programs is in direct proportion

to the quality of the material offered and the manner in which it is packaged. But, before any company management can get into the question of subject matter, it must first determine whether meetings are to be held on company time or on the bosses' time. Other collateral questions include the length of such meetings, the place and the frequency.

**Evening Meetings Best**—We have found after 5 yr experience

in this field that we prefer holding the meetings in the early evening instead of on company time. This permits our supervisory men to meet as division units rather than colliery units, and this has a distinct social advantage.

Prior to our program, Tom Brown, let us say, may have been a fireboss at a large mine in one of the divisions. He probably knew several of his associate supervisors in a personal and friendly way. But after a few division meetings were held we found that Tom Brown not only knows more of the supervisors at his own mine but he also knows Jim Jones, Bob Smith, and Andy Boyle, as well as a host of his fellow men of management who work at other operations within the same division. And that not only means a lot to Tom Brown—it also does a lot for him.

Where practical, meetings should be held on the evening of an idle day. This permits most second- and third-shift men to attend.

Attendance should be strictly on a voluntary basis. This is very important. We send advance notice of all meetings by mail to the supervisor's home and include a return slip which the man may turn in. This is not done for the purpose of keeping attendance records.

**Who Should Attend?**—Another very important point is who should be included in the invitation list. Some companies draw the line at the level of mine superintendents; others go a rank lower. This is a great mistake because it continues the caste system which has been one of management's most grievous errors. All levels of management should be included. Our program begins with the colliery clerk and ends with the division superintendent.

Meetings should be held at a central point convenient to all.

The serious part of the meeting should be limited to 1 hr. This is long enough, although 5 or 10 min tolerance either way is not harmful. This should be followed by an informal social hour and should include the serving of refreshments—all at the expense of the company. This, incidentally, is the only reason we have our men make reservations in advance.

**Social Hour Helps**—We find the social hour to be very beneficial. The fireboss, for instance, who follows his routine day in and day out, might not have the opportunity to know but a very few of his associates; but with a social hour to get acquainted, he soon gets to know scores of them from many operations. We find the men not only catch trout, and shoot pheasants and deer by the hundreds during the social hour but they usually gather in groups to discuss the material that has been presented during the meeting.

It is usually best to have the fewest possible number of top-management men in attendance. Especially to be discouraged is the frequent appearance of top management to "lecture" the men. Our meetings are presided over by the division superintendents, with an occasional visit from the general manager, who merely drops in to say "hello."

**Do's and Don't's in Presenting Material**—As to the method of presenting the material to the men, straight talks or lectures are the least desirable. Talks illus-

trated by slides are acceptable, as is the panel method of presenting a subject.

**Question-and-answer periods** following the main presentation are good, but often hard to get started. It usually is good to "plant" some questions in the audience in advance.

A practice most desired is to have the presentation made, where possible, by one or more supervisors of varying rank from within the company itself. This is especially feasible where the panel method of presentation is used.

As to subject matter, anything connected with the men's work in the company or industry is well received.

**What the Men Want**—After our program had been in operation 2 yr we sent a questionnaire to our supervisors. We did not supply multiple answers from which they might make a selection, but left them to write their own answers. They were not required to sign the questionnaire, neither were they required to answer it. We had, however, replies from 42% of the men queried. The results were very interesting.

Eighty-eight per cent favored meeting on the evening of an idle day; 10% wanted a work day, while 2% did not choose either.

Sixty-five per cent favored the panel-discussion presentation against 32% preferring a speaker and 3% favoring both types of meeting.

On the question of motion pictures, 93% favored them, 5% did not and 2% did not answer the question.

On the question of whether they wanted us to continue these meetings, 93% said yes; 2% said no.

Of those offering suggestions on subjects they would like to have discussed, their preference is set by those subjects receiving the greatest mention:

Question-and-answer period with audience participation.

Mining methods and problems.

Informal singing or entertainment by the men themselves during refreshment period.

Mine safety

More practical demonstrations of subjects discussed.

Information on costs of various mining supplies.

Information on "our job."

Problems of the fireboss.

Electricity in mining.

Concert by Phil Reading Chorus.

Different phases of our industry.

Mine ventilation.

Formation of joint production committees to attend the meetings.

**Reading References**—The men were also queried as to what technical material they would like to read. Again, their preference is listed:

Mine safety.

How to increase per-man-day production.

Mining methods and problems.

More information on our dependence on the success of our company.

Information on other collieries and departments.

Information on cost problems.

Information on how to do my job better.

How to secure a full 7 hr work from all men.

How to handle men.

Information on problems of our industry.

Announcements of personnel changes.

Question-and-answer section on mining problems.

Electrical problems.

Preparation of coal.

Foremen's responsibilities.

Industry research.

Ventilation problems.

Future prospects of company and industry.

Cost of supplies and materials.

Mining laws.

Compensation problems.

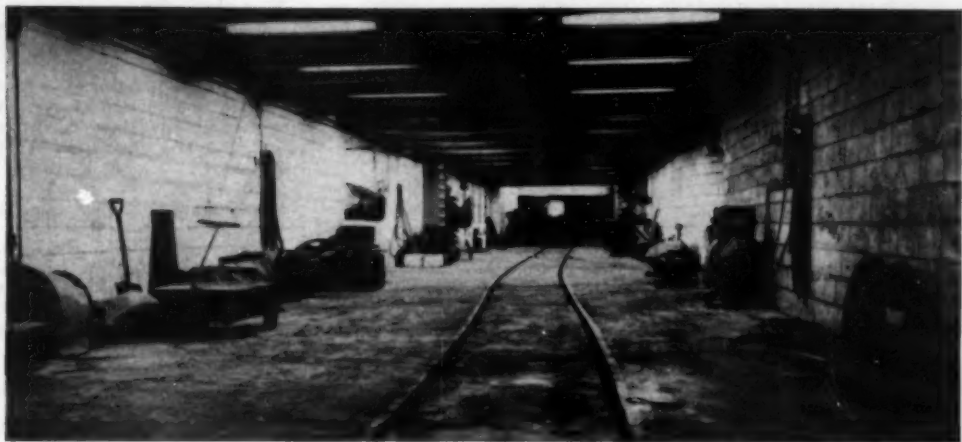
Information on Social Security Law.

Company financial statement.

**Meeting Frequency**—As to the frequency of meetings, 4 to 6 a year, excluding the three summer months, is a good rule. If your company is so large as to require more than one group for the purpose of the meeting, then all the men in the company should be brought together in one meeting at least once a year.

A good idea is for all to meet at a dinner at Christmas. All company officers and officials should attend. The best food should be provided and high-class entertainment engaged. If the chief executive officer of the company can attend, he might speak briefly and off-the-record on conditions in general. If he cannot be there, then there should not be any speeches—just a good time, with everything in the very best of taste.

The investment required for such a program as this is small in comparison to the dividends that can be earned.



**MAIN ROOM** at new No. 9 shop includes two pits, one at each end. Features are double-block walls, steel beams with concrete-slab lagging, and fluorescent lighting. The shop is designed for repair and replacement service only.

**Efficiency, Convenience and Comfort Characterize**

## Modern Underground Shop

**Goal:** Efficient Repair and Overhaul of Production and Auxiliary Equipment at Old Ben No. 9 Mine

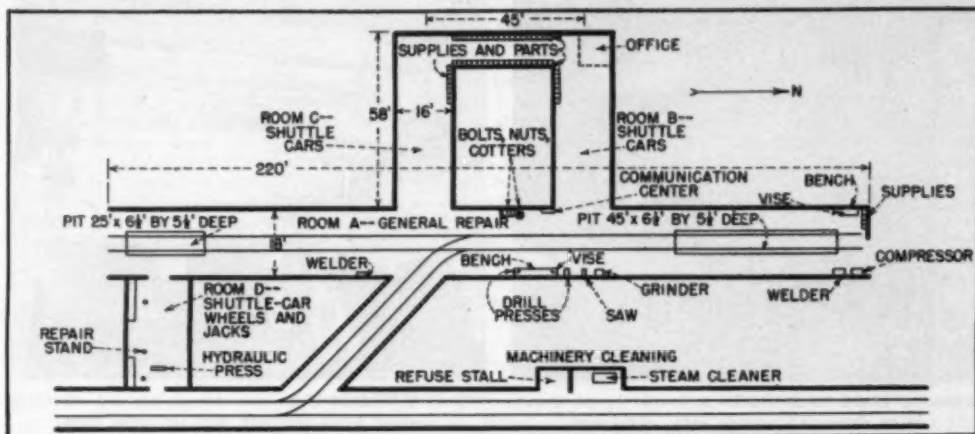
**Facilities:** Main Bay With Two Pits, Three Rooms for Shuttle-Car Service and Special Cleaning Section



**TWO ROOMS** opening off the main room, one of which is shown here, are used primarily for shuttle-car service.



**SHUTTLE-CAR WHEELS** and jacks are serviced in a fourth room. Facilities include three stands for wheel service (right).



NO. 9 SHOP PLAN includes main room; three auxiliary repair, parts storage and office rooms; and a machinery-cleaning section. Tracks enter from south end and east sides.

TO SERVE 19 trackless-mining units producing 9,000 tons per working day of two shifts, plus other auxiliary mining equipment, the Old Ben Coal Corp. recently completed a new underground shop at its No. 9 mine, West Frankfort, Ill., designed for the maximum in efficiency as well as comfort and convenience for its maintenance staff. Two pits, a special machinery-cleaning section, three special rooms for shuttle-car and shuttle-car wheel service, fluorescent lighting, a public-address and mine and outside communication center, built-in tool cabinets, metal parts and supply cabinets, and hoists and cranes at all points they might conceivably be needed, are among the features of the new shop, in addition to steel-and-concrete construction.

The new shop was constructed in a special opening made in the barrier pillar at the bottom of C shaft, No. 9 mine. Design and equipment were worked out by Frank Eubanks, underground maintenance superintendent, and the shop was built under the direction of John Sharkey, day mine manager, who shares the duties of supervision of operations with H. C. Herrin, night mine manager, under the direction of Howard Lewis, general underground superintendent for all the Old Ben mines. Direct supervision over maintenance operations at No. 9 is shared by Nick Kovaleski, day chief electrician, and Clyde Bailey, night chief electrician, with Mr. Kovaleski in general charge of shop operations.

#### • Repair and Overhaul the Goals

The new No. 9 shop was built solely for repair and overhaul of all the equipment used for production and production-supporting operations underground, including mine cars, though these normally are serviced elsewhere on the bottom. By repair and overhaul is meant the replacement of worn or defective parts or units, tuning up, refinishing and so on. Reconditioning of parts or units is done either in the main shop serving all the Old Ben mines or outside.

The unit system of overhaul is employed, and overhauling is done on an inspection rather than a time or tonnage basis. In other words, Messrs. Eubanks, Kovaleski and Bailey are constantly visiting and checking all production and auxiliary units, and when, in their judgment, overhaul is necessary, the machines are brought to the shop for that purpose.

Overhaul, when done, is complete. The machines are cleaned, torn down completely, all necessary parts or units replaced, and the machines reassembled, checked and tuned up, including replacement of trailing cables, if necessary. The final step is repainting, so that the units go out in practically factory-new condition.

In addition to overhaul, of course, the new shop takes care of any routine repair jobs of any consequence, leaving only minor repair and adjustment to be done on the sections. To bring the production units to the shop, two Phillips transporters are employed. One is for loading ma-

chines and the other is for shuttle cars and cutting machines. Distance from the shop to the working sections is now 2 to 4 mi. Eventually, it is expected the maximum will be 7 mi.

• What the Shop Services—The 19 production units serviced by the new shop includes 16 loader and three continuous-miner units. Of the loader units, approximately half are major room-work units operated by full crews, with the remainder development units operated by small crews, or "gangs," driving entries. The continuous miners are presently employed only in development.

A loading machine unit comprises the following: 11 BU loading machine, 10 RU rubber-tired cutter, Old Ben drillmobile mounting two Dooley post drills, two 5 SC or 10 SC Joy shuttle cars and an 8-ton Goodman locomotive.

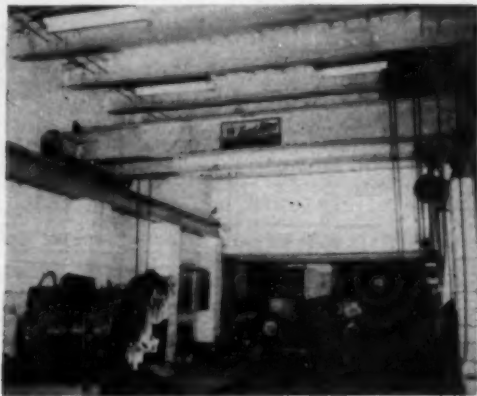
Other auxiliary and service equipment includes the following: three 20-ton Goodman haulage locomotives; 11 8-ton Goodman haulage, relay and service locomotives; two large and four small rockdusters (M-S-A); 45 pumps, including 25 Deming triplex drainage units and 14 1 x 1 turbine units used on spray tanks; and three WL 80 two-stage air compressors. While, as noted, the shop could accommodate mine cars, they normally are serviced elsewhere.

• Shop in Five Sections—The plan of the new No. 9 shop is shown in the accompanying drawing, which also indicates the posi-

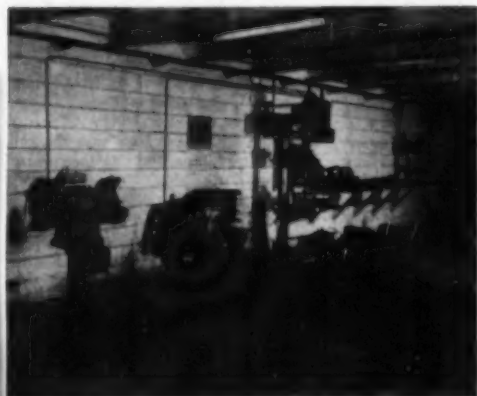
## Special Shop Facilities Tailored to Efficient Maintenance at Old Ben



CLEANING PRIOR TO SERVICING is handled by this electric-steam cleaner in a separate section of the shop.



PITS AT BOTH ENDS of the main room are provided with 15-ton overhead cranes, plus small hoists for lighter lifting.



TOOLS in main room include grinder, saw, floor-type drill press and, on the bench, vise and small drill.



PUBLIC-ADDRESS SYSTEM for shop, mine trolleyphone system, and standard telephones, are centered in board at the right.



SHOP FACILITIES include locked steel tool cabinets in the walls and fluorescent lighting overhead. Shop builders and operators (right), with visitor—John Sharkey (left), day mine manager, in charge of shop construction; Nick Kovalesski, day chief electrician and shop supervisor; Frank Eubanks, underground maintenance superintendent for Old Ben mines and Cliff Christianson, Joy Mfg. Co.



tion of the major tools and auxiliaries. The main section, or Room A, entered by tracks from the south end and through a 45 from the east, as indicated, is 220 ft long, 18 ft wide, 8 ft 1 in high under the beams in the general repair part, and 16 ft high over the pits at each end, which provides a 9-ft 2-in hook clearance over the rails.

The pit at the south end is 22 ft long, 6½ ft wide and 5½ ft deep; north end, 45 ft long, 6½ ft wide and 5½ ft deep. Both pits were designed for recessed lighting and are served by Manning & Maxwell 15-ton "Load Lifter" overhead cranes, supplemented by 2-ton Yale blocks. Between the pits, three 1-ton blocks (Chisholm-Moore) are attached to the roof beams as necessary to accommodate the work being done.

Equipment in the main section, or Room A, in addition to that previously noted, includes work benches at the north end and midway down the east side, the former equipped with a vise and the latter with vise and small Atlas bench-type drill press; Curtiss 3 x 3½ air compressor; two 400-amp G. E. welding machines; power saw; Buffalo No. 22 drill press; two Hisey 3-hp floor grinders; portable electric grinder; two portable air grinders; Roto-Bin and Precision cabinets for bolts, nuts, washers and cotter pins; and the communication center, the latter comprising a public-address system for the shop, connections to the mine communication system (Femco) and a standard telephone to the outside.

Rooms B and C, to the west of the main room, are primarily for shuttle-car service. On 45-ft centers, the rooms are 16 ft wide, 58 ft long and 8 ft 1 in high under the roof beams. A crosscut 8 ft wide between the two rooms is equipped with Precision steel cabinets for supplies and parts, with extensions around the corners for additional capacity. Room B also includes a small office for Mr. Kovalski. Lifting service in Rooms B and C is provided by small 1-ton Chisholm-Moore blocks on Yale Whiz trolleys.

Room D, on the east side at the south end of the shop, is reserved for the repair and servicing of shuttle-car-wheel and hydraulic-jack units. Equipment includes a 50-ton by hydraulic press, two steel work benches, a 2-hp Hisey floor grinder, a monorail crane with 1-ton Chisholm-Moore hoist, and three "barber chairs," or special

stands for working on wheel units.

The stands, embedded in the concrete floor, are made of 5-in double-strength pipe. Special jigs are provided to which the wheel units are bolted. These are equipped with short stub shafts and drop into the pipes. Thus, the wheel units are positioned at proper working height, and can be turned as necessary for convenient working. The monorail is used for placing, removing and storing the units, thus saving heavy handling and lifting.

Cleaning is the first step in a repair or overhaul job—particularly the latter—and the shop design, therefore, includes, on the east side, a special cleaning section. This is a recess in which is stationed an M-S-A Homestead-Yeager electric-steam unit. Next to it, on the south side, is a trash and refuse stall with a concrete floor and, of course, concrete-block walls and steel-beam ceiling with concrete lagging. Consequently, oily material, cans, cables and other refuse can be unloaded in the stall where they are out of the way and can easily be picked up for disposal. At the same time, if the material should be ignited for any reason, the blaze would be confined and damage prevented by the fireproof construction.

Since cleaning is essential and yet is a hard labor-consuming job, the steam cleaner and the convenient cleaning area are expected to result in substantial savings compared to methods hitherto employed.

● **Shop Construction**—For fireproofness, permanency and easy maintenance, the No. 9 shop is built with an 8-in reinforced-concrete floor, double concrete-block walls with the centers filled with concrete and tamped, and 12-in steel I-beams against the roof. The beams are set on 4-ft centers and the spaces between are lagged with Old Ben reinforced-concrete roof slabs. Thus, the top is completely and permanently protected.

For lighting, the shop is provided with 48 fluorescent lighting units, each unit consisting of three 48-in long 40-watt tubes. Units are installed between every other I-beam, making the spacing 8 x 12 ft. Except over the pits, this results in a light intensity at bench height ranging from 20 foot-candles between light units up to 35 foot-candles immediately beneath the units. Higher intensities are not considered desirable because of

the contrast when men have to leave the shop—as they frequently do—to go back into the mine.

Shop tools operate on 220 AC, with 110 AC for lighting. The main control units are mounted in a recess in the 45 on the east side, and consist of a main incoming box and four distribution boxes, one for the welder and tool circuit and three for lights. Lights are split up into a total of six circuits, each protected by a small automatic De-ion breaker.

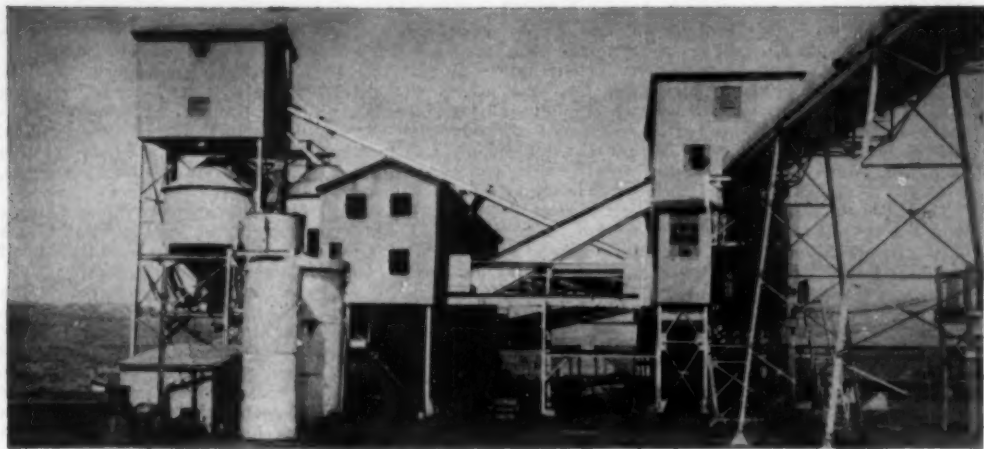
Each tool is protected by an individual safety switch. These, like the main units, are Trumbull safety switches. All power and light circuits are neoprene cable.

Shop facilities include a total of 32 tool cabinets, not all of which had been completed at the time this description was prepared. The cabinets are set in recesses in the concrete-block walls and are steel, 2 ft wide, 4 ft high, and 2½ ft deep, locked with padlocks. Tools are provided by the company. Each man is furnished with his own set, for which he is responsible, and the total cabinet facilities provide an individual locker for each man.

● **Two Crews Handle Maintenance**—All major repairing at No. 9 is done on the day shift. On this shift 10 men are regularly assigned to the working sections, with another 10 nominally assigned to the shop. However, the latter 10 are subject to call anywhere in the mine and spend considerable time on the sections, working in the shop only when not busy elsewhere.

On the second shift, maintenance and minor repair is handled by 12 men—one in the shop and the others on the sections.

The fact that 32 men can handle the running maintenance and overhaul of the number of equipment units in service is a result (1) of constant, careful checking by the underground maintenance superintendent and day and night chief electricians, and (2) less than full running time. If the mine was working full time, a corresponding increase in the maintenance staff would be necessary. However, with the careful attention to maintenance given by the supervisors directly responsible, and the facilities provided by the new shop, any increase in the staff necessitated by increased running time would mean no recession from the high level of efficiency that now prevails at this operation.



TWO-STAGE TIPPLE consists of primary screening plant, right, and rescreening plant, left. Air cleaning of fines normally resulting from mining and preparation provides customers with a dedusted fuel.

## Air Cleaning for Better Fuel

A Cleaner Product for the Customer and Less Waste for the Producer Are Advantages of Air Cleaning as a Step in Dry Methods of Coal Processing—Coal Quality Improved by Removal of High-Ash Fines in Air Separator



AIR SEPARATOR is fed by 14-in screw conveyor with 30 tph of 3/16-in feed. Minus 28-mesh is wasted and plus 28-mesh is blended in slack.

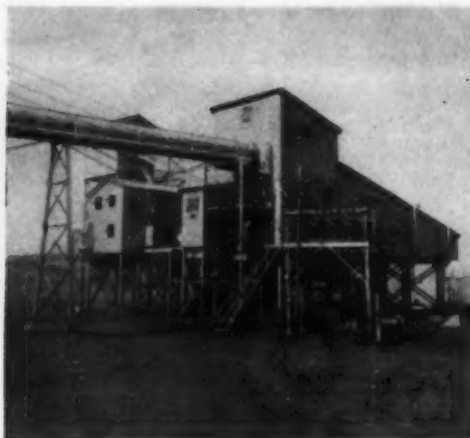
AIR CLEANING of fines in dry-processing high-volatile bituminous coal provides three major benefits for the producers and consumers of the product of Brilliant mine, The Kemmerer Coal Co., Frontier, Wyo. The benefits are:

1. Customers using burning equipment that will handle slack are supplied with a dedusted fuel, which eases their plant maintenance and housekeeping.
2. In this dedusted slack the company finds an outlet for the fines normally resulting from mining and preparation.

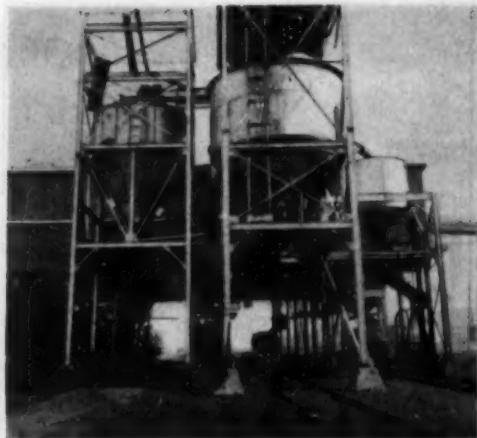
3. Air cleaning permits separation at a size that insures lower ash in the product by removing high-ash fines in the air cleaner.

Brilliant mine produces from the 180-in Kemmerer seam in Lincoln County, southwestern Wyoming, and the coal produced fills fuel needs of commercial and domestic consumers in the western states.

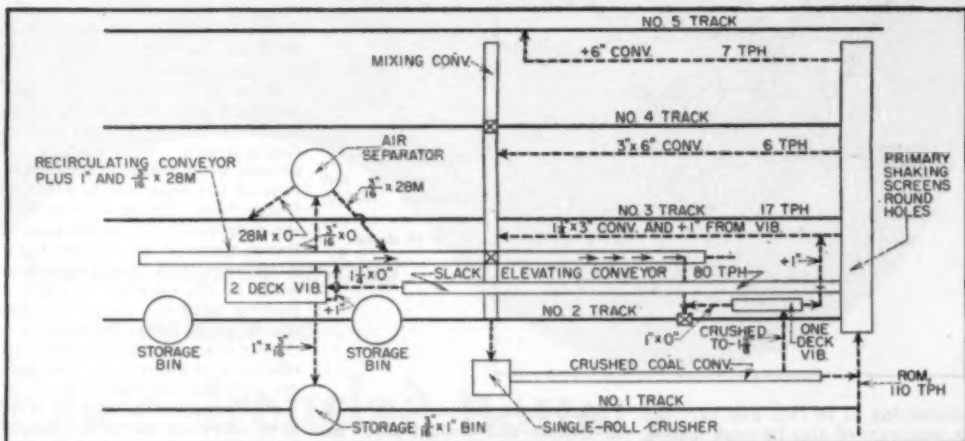
The heart of the cleaning system, with respect to the recovery of fines, is a 14-ft Sturtevant air separator with a rated capacity of 40 tph feed. However, the separator in the Brilliant tipple receives only 30 tph of 3/16 x 0 material. Separation is made at 28-mesh, which tests have proved is the best split for recovering worthwhile tonnage and providing economical reject.



BRILLIANT TIPPLE is integrated with mine for maximum flexibility in converting raw coal to marketable product.



STORAGE BINS (right) and separator serve rail or truck loading. Hopper, under separator is moved to pass railroad cars.



PLANT LAYOUT insures flexibility in dry processing.

Coal is brought to the surface in mine cars and dumped to the plant-feed belt at 110 tph. With a surface-moisture content of from 5 to 6%, recovery of approximately 93% of the plus 28-mesh is achieved.

### The Preparation Cycle

As shown in the plant diagram, the run-of-mine passes over primary screens which sort the coal into  $1\frac{1}{4} \times 0$ ,  $3 \times 1\frac{1}{4}$ ,  $6 \times 3$  and plus-6-in lump fractions. The plus-6-in lump is hand-picked and loaded directly to railroad cars on Track 5. The  $3 \times 1\frac{1}{4}$  and  $6 \times 3$  sizes are hand-picked and directed to a crusher via a mixing conveyor which has loading traps over

Tracks 3 and 4 for rail loading.

The  $1\frac{1}{4} \times 0$  is carried on a slack elevating conveyor to the rescreening plant and fed to a Nordberg vibrating screen with 1-in square holes in the top deck and  $3/16 \times 3$ -in slotted holes in the bottom. The overproduct of the bottom screen,  $1 \times 3/16$  special stoker coal, is loaded out directly on Track 1. The  $3/16 \times 0$  is carried to the air separator in a screw conveyor, and the plus 1-in reports to the recirculating conveyor.

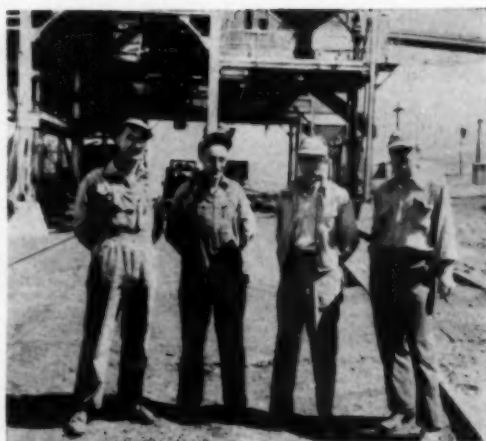
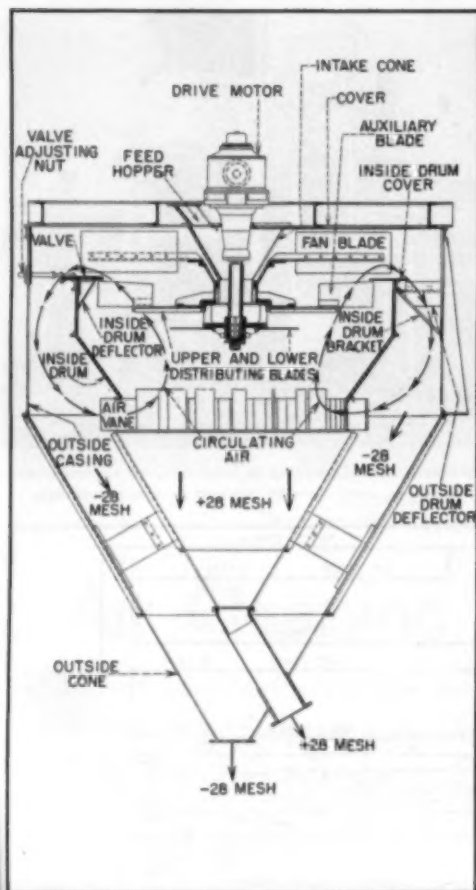
In the air cleaner, as noted, a separation is made at 28-mesh, with minus 28-mesh fines wasted and  $3/16 \times 28$  conveyed to the recirculating conveyor.

The lump sizes,  $6 \times 1\frac{1}{4}$ , are

crushed in a single-roll crusher, which is set to  $1\frac{1}{4}$  in. The crushed coal is conveyed to a single-deck vibrating scalper with 1-in square openings. The underflow from the scalper is blended on the recirculating conveyor with the product of the air separator and the plus 1-in coal from the rescreening plant. The blend from the recirculating conveyor is loaded on Track 2 as dedusted slack, the company's major product. The overproduct of the scalper is recirculated to the crusher.

### Air-Separator Results

The dedusted slack has a top size of  $1\frac{1}{4}$  in and a minimum size of 28-mesh. The separator reject,



BRILLIANT MINE STAFF includes Henry Garnick (left), master mechanic; James Moun, tippie foreman; W. S. Hunter, Jr., chief engineer, and Albert Turk, assistant engineer.

CLOSE CONTROL of operation and simplified maintenance are features of air cleaner.

containing 11 to 16% ash, carries a minimum of plus 28-mesh material. The management of The Kemmerer Coal Co. calculates that the quantity of plus 28-mesh coal in the reject can be economically wasted to protect the low-ash characteristic of the separator product. This separator product analyzes about 8% ash, and the dedusted slack blend about 7% ash.

With 30 tph feed, screen analysis shows fractions in the 3/16 x 28 product as follows:

Minus 28-mesh .....	6.5 tph	21.67%
3/16x28 .....	23.5 tph	78.33%
	30.0 tph	100.00%

Screen analysis of the reject (minus 28-mesh) shows the following:

Plus 28-mesh .....	0.74 tph	11.4%
Minus 28-mesh ....	5.76 tph	88.6%
	6.50 tph	100.0%

Constant experimentation with the cleaner and evaluation of its performance help keep the quality of the dedusted slack up to company standards. Variations in size-consist of the feed to the cleaner are not excessive and do not limit operations. Surface moisture, however, is important, and valve settings are changed when necessary to compensate for changes in surface-moisture content.

### Separator Operation

Operation of the separator is controlled by adjusting 16 peripheral valves which regulate air velocity. Another possible control is the speed of the air vane inside the separator, but at Brilliant a constant speed of 600 rpm is maintained.

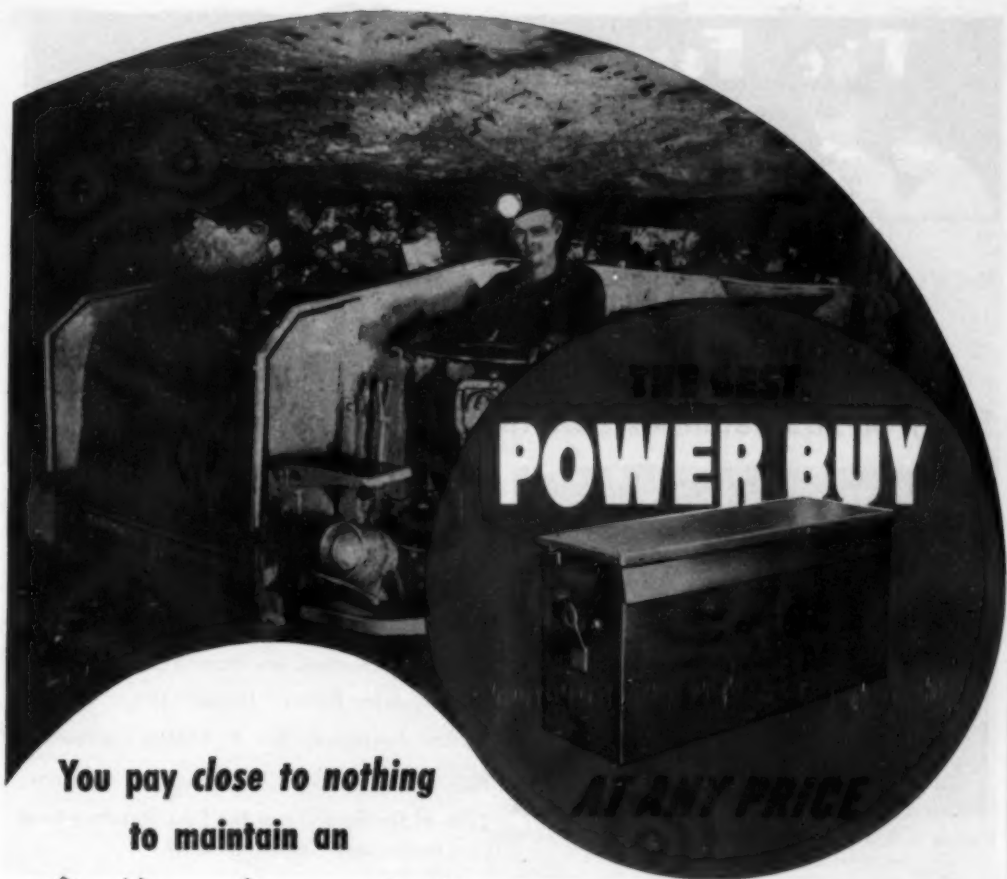
Provisions for adding warm makeup air are included in the

design of the separator, but at Brilliant the air is recirculated and makeup air is not added.

When surface moisture is present the danger of freezing is imminent in Wyoming's cold winters. Consequently, two electric vibrators were installed in the outer cone of the separator to break up frozen fines. These were made in the shop under the supervision of Henry Garnick, master mechanic. After each shift, also, the interior walls of the cone are brushed to remove built-up ridges of fines which might cause turbulence in the air currents, thus lowering the efficiency of separation. Manholes are provided for this purpose.

On the bottom deck of the Nordberg vibrating unit, Mr. Garnick has installed split washers, which are propelled along the screen wires by vibration to prevent blinding. Clear openings of the screen are 3/16 x 3-in., 0.105-in. wire. The split washers are placed on alternate wires across the screen and staggered in the direction of coal flow. Approximately 800 washers are required for a 4 x 4-ft section. As the screen vibrates the washers slide along the wires, wiping away fines before they accumulate to the point of blinding the screen.

The Kemmerer Coal Co. is directed by J. L. Kemmerer Jr., president. G. E. Sorensen, vice president, supervises operations from the company's offices in Frontier, with technical assistance from W. S. Hunter Jr., chief engineer. M. Zakotnik is mine superintendent at Brilliant.



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The "close to nothing" cost of maintaining an Exide-Ironclad Battery amounts to but a few cents a day. This covers cost of repair and replacement parts, including labor and over-all maintenance—testing, adding water, keeping clean, changing. Exide-Ironclad Batteries also assure you:

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# The Foremen's Forum



Here's What You Can Do About . . .

## Miners' Enemy No. 1

Study of 263 Fatalities Puts the Problem of Roof Falls Right up to Foremen on the Job



GOOD SUPPORT, close to the face, offers the greatest opportunity for improving roof safety. It's everybody's job.

### DID YOU KNOW THAT:

74% of Fatalities From Roof and Other Falls Occur Within 25 Ft of the Face?

Mechanical Mining Increases the Hazard?

89% of the Deaths Came From "Human Failure"?

"Management Failure" Caused 48%

Victims Averaged 18½ Yr Mining Experience?

80% of the Fatalities Were in Solid Workings?

22% of the Fatafs Near the Face Resulted From Inadequate Timbering Plans?

LOADED WITH INFORMATION on roof-fall fatalities and with suggestions for improving roof safety, U. S. Bureau of Mines Information Circular 7605 is the result of painstaking investigation of 263 out of the 315 fatalities that resulted from falls of roof, face and ribs in bituminous-coal mines in 1950. Published in May, 1951, the new Information Circular, entitled "Falls of Roof: The No. 1 Killer in Bituminous Coal Mines," was written by J. J. Forbes, chief, Health and Safety Division; T. L. Back, mines safety representative; and H. F. Weaver, assistant chief, Coal Mine Inspection Branch, all of the Bureau of Mines, Washington, D. C.

During 1950, 87% of all underground fatalities at bituminous-coal mines resulted from falls of face, roof and ribs, the authors point out, and this fact again brands roof-fall accidents as the No. 1 killer. The record is a challenge to all forces interested in mine safety, and the problem is of such magnitude that any effort to eliminate roof accidents merits wholehearted co-operation.

Study reveals that 74% of the 263 investigated fatalities occurred within 25 ft of the face, and three out of four fatalities in this zone occurred in the small area between the last permanent roof support and the face, an average distance of 13 ft. Messrs. Forbes, Back and Weaver conclude that this is the most dangerous area in the mines and is the place where special attention must be focussed. Further study indicates that a great many of these accidents would not have happened if a more intense application of roof-support measures well-known to the industry had been carried out.

The average dimensions of 220 pieces of rock that fell and killed men were 12 ft long, 8 ft wide and 1 ft thick. The large average area of the falls points out the great possibility of preventing their falling by the installation of a reasonable number of supports in the immediate face area.

It is significant that only one of all the investigated fatalities resulted from a fall of bolted roof, the writers declare. However, seven other fatal-

ities did occur in places where roof bolts were used, but failure of roof bolting was not involved. Four men were victims while drilling bolt holes without conventional supports for temporary protection, and three while loading coal inby the bolted roof with no temporary supports. Sufficient data now are available to prove that roof bolting definitely is an effective means of reducing roof-fall accidents, the circular states.

Half of all investigated fatalities near the face occurred in mechanical-loading places, though fewer men are engaged in such operations than in hand loading, the authors note in continuing the grim record. This proves that mechanical operations are more dangerous with regard to roof falls, notwithstanding that much closer supervision is possible and is maintained in such places. These facts very definitely indicate management failure in providing sufficient roof support at working faces, the circular continues, pointing out that increased concentration of employees in mechanical loading causes an equal increase

# B.F. Goodrich



## How mine owner gets double wear from BFG tires

THE Allegheny River Mining Company operates an underground coal mine at Cadogan, Pennsylvania. Located in the Lower Kittanning coal vein, the company runs 17 shuttle cars to transport and load coal after it is cut. All cars are now equipped 100% with B.F. Goodrich tires.

These BFG tires are subjected to unusually hard wear, as they travel constantly over coal, rocks and rough road beds. Although operating conditions are most difficult, BFG Universal tires are doing an excellent job at this mine. The tread is giving twice as much wear and longer service than other tires tested. No delays have been caused by

tire trouble. Unusually small maintenance and service have been required.

Reports from B.F. Goodrich users everywhere indicate top performance of BFG mine tires as compared with other brands. Specially compounded tread rubber resists cutting. More tires can be recapped because the patented B.F. Goodrich *nylon shock shield* gives extra bruise protection . . . through layers of strong, elastic nylon between the tread rubber and the cord body. This nylon shock shield is an exclusive B.F. Goodrich feature and is found on all BFG tires of 8 or more plies . . . at no additional cost to you!

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off-the-road tire for every need . . . including the new *all-nylon* tire for coal mines, construction projects, quarry work, strip mining, etc. See your dealer or write for additional information. The B.F. Goodrich Company, Akron, Ohio.



## Only 11% of 263 Fatalities Were Unavoidable, Roof-Fall Analysis Shows

in the destructive potentialities of each fall of roof. Therefore, a comparable increase in roof-support expenditures would be justified from an economic as well as humane standpoint.

Hand loaders, including those loading into mine cars or onto conveyors, suffered the greatest number of roof-fall fatalities, but the number of hand loaders is greater than the number of employees in any other classification. Loading- and cutting-machine operators and helpers rank high on the dangerous-occupation list, accounting for 28% of the fatalities. Considering the relatively small number employed, timbermen also had a very bad record, 10% of the total. The fact that 21 foremen were roof-fall victims probably places this occupation in the "most-dangerous" category and is an adverse reflection on the interest and competence of some supervisors in roof control.

Human failure was responsible for 89% of the 263 investigated roof-fall deaths, and causes that it is believed could not be foreseen or avoided accounted for the remaining 11%. Management failure was responsible for 48% of the fatalities, employee failure accounted for 29%, joint or undetermined failure for 12% and unforeseeable causes for 11%, the authors declare. The term "management failure" is used instead of "supervisory failure" because in many instances it was difficult to determine at what level in the chain of command the failure occurred.

Of the 127 fatalities charged to management failure, the analysts ascribe 84 to poor-quality supervision at the face-boss or mine-foreman level, adding that it is very likely some of the deaths charged to employee failure to correct conditions that developed in the absence of the foreman would have been prevented if official inspections had been made more frequently during the shift.

On the matter of roof testing, the study notes a tendency to rely on such testing as a substitute for supports, especially in areas where roof is considered to be good.

The average mining experience of roof-fall victims was 18½ yr, with the victim of longest experience having 57 yr service. Thus, the theory advanced by many in the industry that only inexperienced employees suffer such accidents is not supported. On the contrary, the facts lend credence to the theory that close association with the dangers inherent in mining causes men to become accustomed to them, thereby creating an atmosphere conducive to accidents, the circular says.

Another startling disclosure of the study is the fact that 80% of the 263 fatalities occurred in solid workings, and 20% in pillar workings.

Of the 127 fatalities charged to management failure, the causes and number charged to each were:

1. Foreman did not have a known bad roof condition corrected, (47).

2. Foreman was aware of large unsupported area under which men were working but did not have condition corrected, (33).

3. Foreman examined roof but did not detect bad condition, (8).

4. Foreman visited place just before accident occurred but did not examine roof, (7).

5. Unnecessary exposure of foreman to obviously great danger, (6).

6. Failure to examine roof and ribs along haulageways, (5).

7. Crosscuts opened opposite each other, (4).

8. Management allowed place to be driven too wide (up to 60 ft), (3).

9. Foreman ordered men to work in inactive area without first examining area, (3).

10. Proper support material not supplied, (2).

11. Underground supervision not provided, (2).

12. Foreman required men to work in area where a roof fall was imminent, (2).

13. Failure to maintain straight pillar-line resulted in bump, (1).

14. Roof-bolting plan not strictly followed, (1).

15. Foreman ordered men to recover timbers by hand from mined-out area, (1).

16. Foreman did not require use of temporary supports while installing roof bolts, (1).

17. Foreman did not correct a condition of inadequate clearance between timber and rolling stock, (1).

With regard to employee failure, causes and tolls were:

1. Employees did not correct bad conditions that developed in hand-loading places in the absence of foremen, (36).

2. Employees removed roof supports to permit free movement of equipment, (8).

3. Employees did not correct dangerous conditions that developed in machine-loading places in the absence of foremen (roof was adequately supported at time of foreman's inspection), (7).

4. Employees did not detect or support bad roof caused by blasting, (6).

5. Employees did not carry out instructions of the foreman, (5).

6. Voluntary and unnecessary exposure to known great danger, (5).

7. Intentional removal of supports to facilitate hand loading, (3).

8. Careless or reckless operation of equipment, (3).

9. Men working in mines in violation of a State closing order, (2).

10. Employee did not replace posts knocked out by machine, (1).

Joint or undetermined failure accounted for 31 of the 263 investigated deaths, as follows:

1. Victims were attempting to secure roof that fell, (15).

2. Rolling stock dislodged roof supports, (11).

3. Victims were taking down loose roof, generally with a pick, (5).

Dangers that could not be foreseen took the lives of 29 men. Examples of conditions under which such accidents were charged:

1. The roof seemingly was well supported with crossbars set close together, but a piece of rock fell between them.

2. A fall started near the face and "rode out" as many as six crossbars set close to the face.

3. Kettle bottoms that could not be detected by sight or by sound test fell without warning.

4. The piece of roof that fell seemingly was well supported.

Other facts turned up by the investigations and study show that 44 of the 196 fatalities near the face occurred where a timbering plan was followed, thus showing the inadequacy of the plan, that mines employing less than 25 men were almost twice as dangerous as those in any other size group, that more roof-fall fatalities occurred between 1 and 2 pm, 3 and 4 pm and 5 and 6 am than at any other hours of the day and that the average age of the victims was 42 yr.

Recommendations to management and employees made by Messrs. Forbes, Back and Weaver in summarizing the results of their study included these:

### Management should:

1. Maintain minimum standards for systematic roof support suited to the conditions and mining system at each mine.

2. Upgrade the quality of supervision through educational programs conducted by management or other qualified organizations.

3. Require close examination of the face, ribs and roof of all mine openings by competent, certified officials as often as necessary to insure safety and require prompt correction of all deficiencies.

4. Refrain from opening crosscuts, rooms and entries opposite each other.

5. Demand that crossbars be sufficiently spragged to prevent their dislodgment.

6. Adopt roof-bolting as a means of support where experiments show it is feasible and practical.

### Employees should:

1. Co-operate fully with management in developing a roof-support plan and complying with it.

2. Be constantly alert to changes in roof conditions in the absence of the foreman and take immediate steps to eliminate any danger that might arise.

3. Provide self-protection and protection for fellow workers by taking special training in accident prevention.

4. Properly use a steel bar instead of a pick to take down loose roof.

5. Refrain from deliberately removing roof supports to facilitate loading without providing equivalent support.



## A GUIDE

to Correct Disc Selection

Jenkins Bros. Inc. Montreal, Canada

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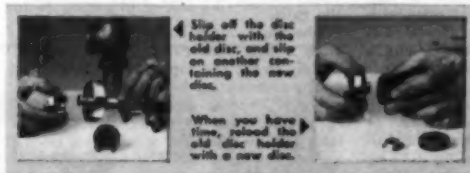
The disc holders shown above, fitted with Jenkins Discs, are for Jenkins Check, Globe, and Angle Valves. Two have guide disc nuts. One, at extreme right, is fitted with throttling nut.

**N**ow, when *continuous valve efficiency* is vital . . . you can rely on readily available Jenkins Renewable Composition Discs to provide the valve protection that greatly extends service life. Proper disc selection and replacement in time guard against premature wear, can multiply the original efficiency of valves many times over.

Disc replacement is simple and easy, can be done without removing valves from the line. To save more time, maintenance-wise valve users keep on hand a stock of disc holders fitted with the discs most commonly used.

### Money-saving idea for disc-valve maintenance

Keep on hand a stock of disc holders fitted with the discs most commonly used. This permits quick replacements, saves valuable time.



### Only Jenkins makes both Valves and Discs

Originator of the first successful Renewable Composition Disc, Jenkins Bros. has continued to set quality standards. That's why you can rely on your Jenkins Distributor for discs of time-tested design and composition, plus authoritative disc information.


Ask your Jenkins Distributor for the folder, "A Guide to Correct Disc Selection" . . . also the "Jenkins Disc Selector", a handy wall chart listing recommended discs for all common services, temperatures, and pressures. Or write Jenkins Bros., 100 Park Ave., New York 17. Jenkins Bros., Ltd., Montreal.

Sold through leading Industrial Distributors everywhere

# JENKINS

LOOK FOR THE DIAMOND MARK

# VALVES

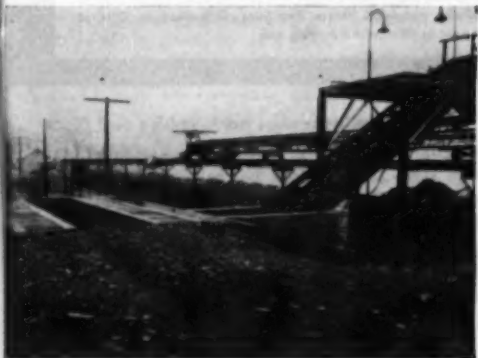


Jenkins Bros.

# Operating Ideas



**ELEVATED TRACK** supports a 254-ft reversible belt conveyor mounted on wheels (right) for loading 13 railroad cars on each track without spotting once the cars have been switched into position.



**CROSSOVER TRUCK DUMP** with grid-type tracks is equipped with a belt feeder that completely empties the hopper. On each end of the 36-in shuttle conveyor there is a control platform and a pair of chutes discharging to the two tracks (right).

## Elevated Shuttle Conveyor Loads 26 Cars Without Spotting

**TWENTY-SIX RAILROAD CARS** can be loaded at a truck ramp at Pomeroy, Ohio, without moving the cars once they have been set in by the switching crew. The coal is distributed to two strings of 13 cars each on adjacent loading tracks.

Six-inch extra-heavy pipe columns between the railroad tracks support an elevated narrow-gage track 550 ft long, on which rides a 36-in by 254-ft Barber-Greene belt conveyor

mounted on flanged wheels. The belt conveyor, geared to operate at 420 fpm, is reversible and is equipped with a diversion gate and a pair of discharge chutes at each end. The entire conveyor can be trammed in either direction at a rate of 25 fpm and is powered by a 3-hp motor controlled from the operator's platforms at either end of the conveyor. The conveyor belt itself is driven by a 15-hp motor supplied with 220-v three-phase

power through a trailing cable that drags on the elevated track between the rails.

The truck-dump hopper is equipped with a belt feeder which will completely empty the hopper. The elevator to the distributing belt is a flight conveyor. Controls on the twin operator's platforms at each end of the unit include those for the feeder, elevating conveyor and the distributing shuttle conveyor.

# GOULD

**Plus-Performance**

**Plan**

... TELLS YOU HOW TO

## SELECT YOUR BATTERIES TO FIT YOUR JOB!

You can increase battery performance as much as 50% through the help of the **GOULD PLUS-PERFORMANCE PLAN**. Here is a complete and integrated system of manuals, articles, specifications, bulletins, record cards, and charts which explain and illustrate how to select, charge and handle, maintain, and determine the condition of your batteries. Designed to help you conserve and extend your essential battery power the **GOULD PLUS-PERFORMANCE PLAN** is **FREE** to **ALL** battery users, without obligation. A request on your letterhead, will bring book describing the plan by return mail.



### AN EXAMPLE OF PLUS-PERFORMANCE PLAN HELPFULNESS

#### How To Select Mining Batteries

FOR SHUTTLE CAR BATTERIES, selection is comparatively simple. A 13-plate, 330 AH battery is standard for low coal. Where height permits, an extra-high 9-plate, 400 AH battery can be used. For ore mines, 17-plate, 440 AH batteries are preferred.

FOR LOCOMOTIVES, selection is more complicated for it involves consideration of grade, weight and distance. The **GOULD PLUS-PERFORMANCE PLAN** includes a table showing the watt-hours needed to move one train-ton various distances over various grades, and full instructions on how this table can be used to determine the total watt-hours required per shift, the total cells necessary and the ampere-hour capacity required of the battery. These simple computations enable you to order exactly the size and type battery needed to do your job.



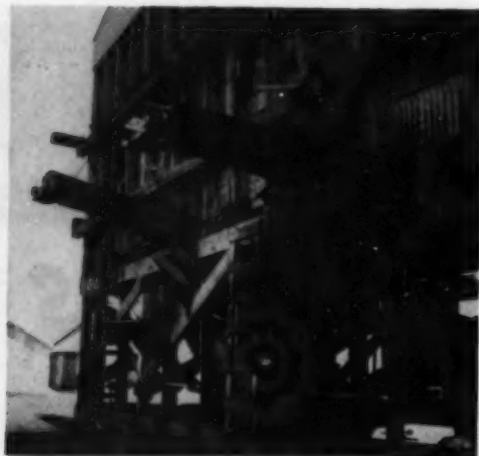
Gould "Thirty"  
with "Z" Plates—  
America's Finest Mining Battery

# GOULD

## STORAGE BATTERIES

GOULD-NATIONAL BATTERIES, INC., TRENTON 7, NEW JERSEY

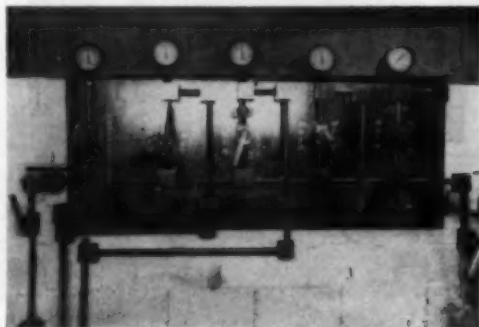
*Always Use Gould-National Automobile and Truck Batteries*



## Old Loaders Never Die!

TWO CAR-LOADING CHUTES at Sterling mine, McNeil Coal Corp., Dacono, Colo., have been made from the discharge booms of retired Joy loading machines. The original discharge conveyors, now operated by chains and sprockets from a motor-driven shaft, impart feeder action to the improvised chutes. Hand-operated clutches start and stop the chute conveyors while the shaft is turning, and hand cranks raise or lower the chutes through a system of cables and pulleys as shown.

According to A. W. Newcomb, mine superintendent, the original loading machines were purchased in the "Twenties" and retired after World War II.



## Air-Breaking Lines Arranged to Simplify Checking for Leaks

THE MAIN DISTRIBUTION POINT for airlines underground at Zeigler No. 3 mine, Bell & Zoller Coal & Mining Co., Zeigler, Ill., is especially set up to facilitate regular tests of the operating pressure on the four lines leading to the individual sections. The mine uses Airdox for breaking coal throughout.

Located near the underground workshops and the mine manager's office, the distribution panel shown above consists of a main line from the surface compressors, which carries about 10,000 psi, and the four lines to the sections, each of which is provided with a pressure gage.

Each section line is tested weekly, by closing it and

recording the time and any drop in pressure. Any section line showing an above-normal drop of pressure or increased time in building up the air pressure is promptly inspected for leaks.



## Steel Racks Keep Timber Stacks in Order

ALONG WITH INHIBITING timber decay, steel racks made from scrap rails also provide maximum safety by stabilizing the stacks. Assembled by the welders at Warwick mine, Duquesne Light Co., Greensboro, Pa., the racks keep timber off the ground to permit fresh-air circulation while providing a base to which trucks can load and from which mine cars can be loaded.



## Mine Scooter Speeds Getting-Around in Low Coal

THIS MINE SCOOTER, demonstrated by Ernest Strunk, section foreman, is one of several in use at Mine No. 30 of the Peabody Coal Co. Average height in the mine is 38 in., and the scooters are very popular with the supervisory staff as a result.

## COAL AGE WELCOMES YOUR IDEAS

THIS SECTION, LIKE MOST OF COAL AGE, is "written" by experienced coal men who help us report their ideas for getting lower cost and better quality coal. That's why we're always glad to hear from any reader who has successfully put to work a good operating idea. Why don't you write us what you've done, with photos or rough drawings if available? We'll gladly pay \$5 or more for each usable item, on publication.

# GET MORE MILEAGE *From Your Wire!*



## Use O-B Fittings to Remove Cause of Wear

Because of their bump-free method of wire-holding, O-B High Mileage Trolley Wire Fittings reduce wire wear and increase the number of current collector passes on your overhead system. Mileage, the total distance traveled by current collectors on your wire, is an important figure. Higher mileage means lower costs for you in terms of wire and wire maintenance.

O-B High Mileage Trolley Wire Fittings remove the principal cause of wire wear—arcing—by removing the bumps and bouncing which cause arcing between the collector and the wire. Clamps and splicers do this by holding the wire at its upper lobe only. Frogs and crossovers, in addition, provide a smooth transition from wire to runner and from runner to wire. Because it presents such a smooth underrun, current collectors cling to a wire which is held with O-B fittings.

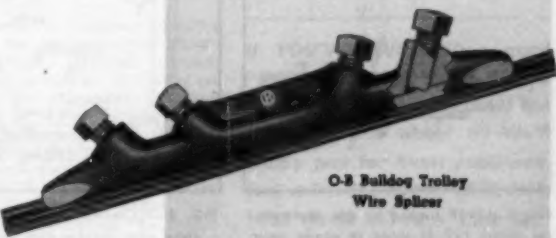
High speed haulage without bumping and burning—high mileage from the trolley wire—low maintenance—these are the reasons why we recommend O-B "High Mileage" Trolley Wire Fittings for your next overhead installation or renovation.



O-B Bulldog Trolley Clamp



O-B Combination Feeder-Trolley Clamp



O-B Bulldog Trolley Wire Splicer

# Ohio Brass

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4100-48

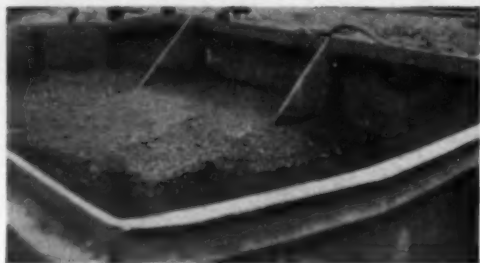
CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.



## Three-Arm Coal Drill Licks Underground Bottleneck

SEEKING A SOLUTION to a bottleneck in drilling for Airdox breaking at the New Kathleen mine, Union Colliery Co., DuQuoin, Ill., led to the building of the three-arm coal drill shown here from a two-arm unit formerly in use, reports Harry Williamson, chief electrician.

With the new three-arm drill, an average of 300 4-in holes are drilled per shift, as compared with 210 holes previously averaged per shift. The operator of the center arm is protected from the outside arm swinging over against him by limit chains placed between the two arms.



BEFORE—Accumulated fines cut capacity and increase dead load.



AFTER—Fast, high-pressure washing produces a clean car.

## High Pressure Hose Cleans Mine Cars

FAST MINE-CAR CLEANING is a feature of the new high-pressure washing system for cutting out built-up fines in cars at Warwick mine, Duquesne Light Co., Greensboro, Pa.

Taking advantage of unlimited water in the nearby Monongahela River and the existing elevated tank at the

mine, John Stephenson, mine superintendent, provided an A-frame and winch to raise one side of a car, and a length of fire hose and a nozzle to direct the stream. The operator controls the stream by means of a long handle strapped to the swivel-mounted nozzle. With this set-up, it takes little time to restore cars to full capacity.

## Derail Warning Devices Aid Hoisting Engineers at Japanese Mines

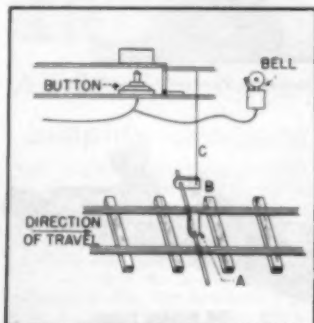


FIG. 1—LEVER tripped by axle of derailed car causes bell to sound in engine room.

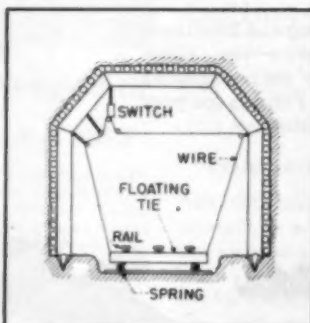


FIG. 2—FLOATING TIES actuate warning signal when derailed cars depress them.

SIGNAL BELLS actuated by derailed cars warn slope hoisting engineers of trouble at Bibai and Ikushunbetau mines, Hokkaido, Japan, according to Report No. 140, Safety in Japanese Coal Mines, published by the Natural Resources Section, General Headquarters, Supreme Commander for the Allied Powers.

At Bibai mine, the signal system (Fig. 1) consists of a rod which carries a lever (A) that will be cleared by the axles of cars on the track but will be struck by the axle of a derailed car. When this lever is struck it turns the rod, thus causing another lever (B) to pull a wire (C) which releases a weight (D) onto a signal button. The depressed button closes the circuit to the bell in the engine room.

At Ikushunbetau, two floating ties are mounted on springs in a box under the track (Fig. 2). Steel wires attached to the ends of the ties are arranged to close the signal circuit when the weight of a derailed car depresses the floating ties.



PUMP ROOM CONSTRUCTION at Old Ben No. 9 mine includes steel beams with concrete roof slabs, concrete-block walls and crushed-slag floor, with control equipment on one wall.

## Neatness and Utility Feature Modern Pump Room

HOUSING THE MAIN PUMP for Shaft C of No. 9 mine of the Old Ben Coal Corp., West Frankfort, Ill., a new pump room combines both neatness and utility, along with the maximum in fireproofness. The pump is a 6-stage Goulds centrifugal, 4-in suction and discharge, with a capacity of approximately 350 gpm. Since the

sump is above suction level, no priming equipment is required, and operation is float-switch controlled.

Pump-room construction includes concrete-block walls, steel I-beams and lagging between beams with Old Ben reinforced-concrete roof slabs. The floor is crushed slag.

The pump is driven by a 75-hp Type

SK Westinghouse motor, started and stopped by an Ohio Brass Type BH controller, preceded by a Trumbull safety switch. Lighting is provided by a circuit of bulbs in weather-proof sockets extending completely around the room. Ample room is provided for inspection and any possible repair or replacement.



LOOKING FRESH after a general overhaul, this old locomotive will continue to pull coal at Defiance mine, Scuddy, Ky.

## Aged Locomotive Gets New Lease on Life

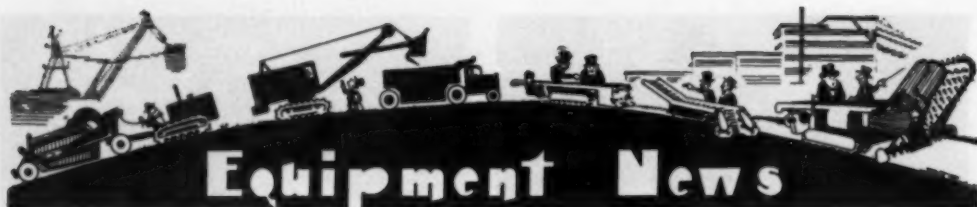
OVER 30 YEARS OLD and still pulling coal is the record of an old Jeffrey locomotive recently overhauled by the maintenance staff of the Marlowe Coal Co., Lexington, Ky., according to Rollie Garrison, mine electrician, Defiance mine, Scuddy, Ky. Purchased three decades ago as a used unit, the locomotive had its first general overhaul late in 1950.

In modernizing the locomotive, the Type 120 motors were replaced with Type 88 motors, new Guyan resist-

ance was installed, fenders were added to protect the operator from wheel-thrown material, solid-oak bumpers covered with  $\frac{1}{4}$ -in-thick steel were renewed and the gage was increased from 42 to 48 in. A paint job completed the process.

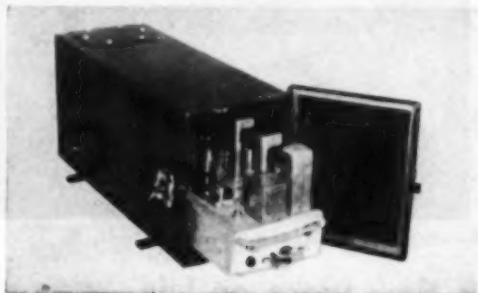
"It would be difficult to estimate the amount of coal gathered by this locomotive over its 30 yr with Marlowe Coal Co.," Mr. Garrison writes, "and in its renewed condition we expect it to pull coal for many more years."

**IF YOU'VE DEVELOPED** a good "Operating Idea" that has done a job at your property, why not tell COAL AGE about it? We'll gladly pay for items published. Just write: The Editor, COAL AGE, 330 W. 42 St., New York 18.



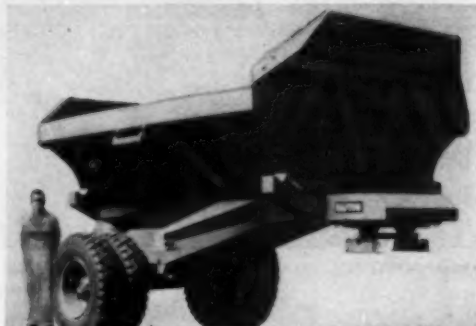
#### Compact Self-Rescuer Lasts 30 Min (1)

For emergencies in air contaminated with carbon monoxide, the new MSA self-rescuer has been developed as a small compact lightweight device to protect the wearer for 30 min in CO concentrations found after mine fires or explosions and is approved by the USBM for such use. The unit is simple to use and compact enough to be carried personally, and a supply can readily be stored at strategic locations, the maker points out. Low cost of the replaceable cartridges also makes the device economical for training, it is said. Bulletin EC-1 gives full details.—*Mine Safety Appliances Co., Pittsburgh 8.*



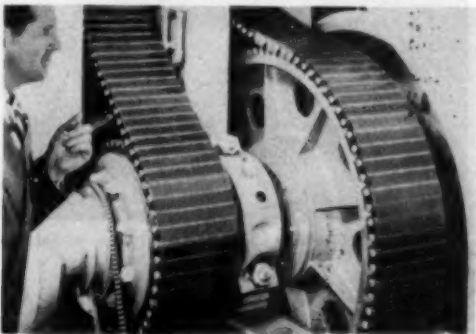
#### New Mine-Radio for Two-Way Talking (2)

Improved GE carrier-current FM transmitter-receiver for mine communication provides two-way voice communication between a fixed mine station and a mine locomotive, two fixed stations or between two locomotives operating on the same line, and will also serve for emergency communication if needed. A stable source of voltage is provided by a 6-v automobile-type storage battery, which is charged from a DC trolley line through dropping resistors or from an m-g set on the locomotive. The unit is plugged-in to make all connections and utilizes a loud-speaker calling system and a telephone-type handset for speaking.—*General Electric Co., Schenectady 5, N. Y.*



#### Side-Dump Trailer Boosts Capacity (3)

Available in rated capacities of 14, 17 and 20 tons, newly improved Easton Model TP trailers are said to provide a 12% increase in water-level capacity with no change in overall dimensions over previous models. The doorless pan-type trailers may be dumped to either side and the body is reversible to prevent excessive wear on one side. They also are particularly adaptable to fixed-point dumping, using an Easton automatic electric overhead dumping system. Among the improved design features cited by the maker are better load distribution to provide greater traction on the tractor axle and stronger edge construction on the new all-welded body. Bulletins available from the *Easton Car & Construction Co., Easton, Pa.*



#### New-Type Chain Permits Smaller Units (4)

Featuring entirely new design principles, the new Morse Hy-Vo (high velocity) chain drive, for use on stationary and self-propelled engines and motors of 100 hp and up, combines the strength and dependability of a gear drive with the smoothness and lack of vibration of a belt, the maker reports. Besides large increases in speeds with much narrower widths than with conventional drives, the Hy-Vo units eliminate the need for wide unwieldy drives with costly accessories required for high-speed engines,

## Material on Mining Bits



Proper instructions, vitally important to the correct use of carbide tools are available on mining machine bits, coal auger bits, strip bits, and

rock bits. They are thorough, time-tested, and reliable. Write Kennametal Inc., Latrobe, Pa., pioneers and world's largest manufacturers of cemented carbide mining tools.

A complete tool catalog is also available that gives specifications, prices, and performance data on Kennametal Mining Tools. Specify M-6. Any of the above material will be sent to you on request.

## New Bit Rotary Drills Bolt Holes in Laminated Sandstone

*Drills hundreds of feet in hard roof*



To give the greatest wear resistance in drilling hard roof, the Kennametal HFD Bit is tipped with a thick insert of Kennametal cemented carbide.

The bit fits into regular Kennametal Roof Bolting Rods. It is powered by ordinary electric drills. Material drilled with the bit is slate, shale, and laminated sandstone. The four main features of the bit are: (1) Smoother hole without rifling, (2) Longer gage life in hard roof, (3) Easy bit sharpening, (4) Lower bit cost than obtainable with any other bit used for drilling medium hard mine roof. Sizes are 1 1/4-inch to 2 1/4-inch, prices range between \$4.85 and \$14.80, depending upon size and quantity.

## Machine Bits Bore Rock



Six regular mining machine bits act as cutting teeth in this rigidly constructed bit used for rock boring. The "teeth" are set in a heavy cast steel

head. They are secured by set screws which allow them to be removed for sharpening when dulled. Drilling speeds are 3' to 3 1/2' per minute in average drilling. Feature: Ability to drill hard rock formations. Style is UD 6 1/2". The price, including bits, is \$45.10 to \$59.40 depending upon quantity.

(ADVERTISEMENT)

**How a Drill Bit can have 40 lives!**

**4,000 feet in ordinary drilling 40 regrinds**

Two things make it possible for a bit to achieve a fortieth life. One is its high quality Kennametal tungsten carbide cutting edge and another is the kind of maintenance that is given to it. Poor or improper maintenance is, in most instances, the reason for early fatality. Is your Kennametal Bit changed when it gets dull? Is it reground according to recommended sharpening methods? If not, then a forty-life bit is improbable, and cost sacrifices are made in terms of lower drilling speed, higher drill maintenance cost, higher bit cost.

Under average drilling conditions, where the drilling is largely done in coal with only minor quantities of impurities, the Kennametal Drill Bit can, if properly cared for, give 4,000 feet or more of service or a hundred or more feet of drilling per sharpening. If your performance is less, it may be advisable either to look carefully yourself to be sure the right precautions are being used or better, ask your Kennametal representative to give your procedures a once-over. He knows from daily experience the ways in which bit service can be improved. The way to get maximum life, 40 lives if you're in average coal, is to remove the bit when dull, sharpen it as per the instructions that are prescribed by your Kennametal representative. Kennametal Inc., Latrobe, Pa.

*Names and addresses of Kennametal representatives appear in your 1951 McGraw-Hill Mining Catalog.*

## GRINDING INSTRUCTIONS



For the best service life on your tungsten carbide mining tools, they should be reconditioned at regular intervals and according to proper procedures. Conserve bit life by following proper grinding techniques. Write today for a copy of our complete, fully-illustrated folder on proper bit maintenance.

# KENNAMETAL®

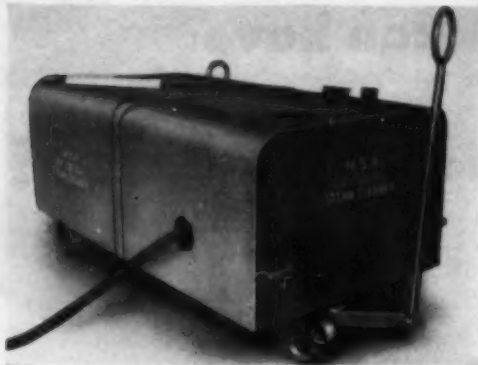


**DRILL BITS • MACHINE BITS • ROCK BITS • ROOF BITS**

***Bits for Every Cutting & Drilling Need***

## EQUIPMENT NEWS—For More Information, Use the Card Facing p 120

It is said. A 2-in Hy-Vo drive has transmitted up to 500 hp and a 6-in unit will do the job of a 24-in belt drive, the company says, and as a result of the new design, the usual "chordal" action, chain slippage and pitch elongation are eliminated. Bulletin C-72-51 available.—Morse Chain Co., Detroit 8.



### Unit Cleans Machines Underground (5)

Mining machinery now can be completely, quickly and safely degreased and cleaned on the job at any point in the mine where electricity and water are available with the new MSA all-electric steam cleaner approved by the USBM, the maker reports. Labor available in the mine is used, and the need for combustible and toxic cleaning agents is eliminated with the MSA Cleaning Compound, a non-flammable powdered cleaner developed for use in a heated-water solution. Besides keeping machinery oper-

ating efficiently, regular cleaning also eliminates many fire hazards, the company points out. The unit's tank holds a 4-hr supply of solution, which is automatically mixed and controlled during operation. Standard fresh-air models also are available. Bulletin AP-1 offers details.—Mine Safety Appliances Co., Pittsburgh 8.



### Lubricators Speed Field Service (6)

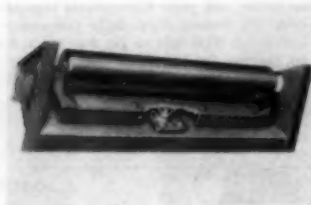
Graco field lubricators, redesigned for better, faster lubrication of large equipment right on the job, features two sizes of new Powerflo pumps that easily handle the heaviest greases and can be quickly mounted on a truck or trailer, the maker reports. The Convoy Lubers are offered as ready-to-work completely assembled units with all hose and accessories or as "job-planned" units selected and assembled by the user to meet his needs. All grades of grease and oil required are pumped directly from original containers, or from lubricant hoppers if desired, and dispensed through reel-mounted 30-ft hose. 24-p Catalog 700 offers full data on both ready-to-work and job-planned units.—Gray Co., Minneapolis 13.



### Circuit Breaker Has New Tripping Device (7)

A new Westinghouse DB-50 low-voltage air circuit breaker has an interrupting capacity of 50,000 amp and is designed for application in low-voltage power-distribution systems, motor starting duty and similar uses. The DB-50 features a completely new air-delayed series overcurrent tripping device, with all elements completely adjustable, that provides long-time delay on overloads and instantaneous tripping of fault currents. For use on feeder and back-up breakers, overcurrent trip units, including both a long-time delay and short-time delay element, can be spe-

cified. Rated at 600 v AC, 250 v DC, the DB-50 has a continuous rating of 100 to 1,600 amp and can be operated manually, or by either DC solenoid or AC Rectox solenoid. Bulletin B4740 gives details.—Westinghouse Electric Corp., Pittsburgh 30.



### Return Idler Guards Against Belt Damage (7)

Improved Rex Style No. 33RA self-aligning belt-conveyor return idler is designed to prevent belt damage from roving which generally occurs at the edges on the return run, where the belt is closely confined between the frame and supports and is usually difficult to observe. It is said to provide automatic alignment for the return run of the belt without the use of side-guide rolls, and is equally effective with horizontal, inclined or declined conveyors and is unaffected

by build-up of material on the roll. The new-type idler is equipped for high-pressure greasing with an hydraulic-type fitting as standard. Details from Chain Belt Co., Milwaukee 4, Wis.

### Two-Way Radio Offers Selective Calling (9)

The first all-electronic selective dispatching method for two-way radio systems, developed by General Electric, is said to permit "private" conversations between a dispatcher and an individual mobile unit, or a

## 55 NEW PRODUCTS . . .

OR CATALOGS are described in this section. Have you checked through them—or are you missing a good bet that may help you jack output and cut operating costs? The handy postage-free card facing p 120 will bring you more dope on any of them—without obligation. Just circle the numbers of the items that interest you, tear out card and mail.

# More Miles Per Day— More Miles in the Life of Your Trucks

Trucks with Eaton 2-Speed Axles "make time", not only on the open highway, but in city traffic as well. Even more important, Eaton 2-Speed Axles save wear-and-tear on engine and power transmitting parts; keep trucks in service, and add thousands of miles to vehicle life. Many exclusive features com-

bine to give Eaton axles long life with minimum maintenance cost. Planetary gears distribute loads over several gear teeth, dividing the stress. Positive lubrication, even at slow speeds, reduces friction wear. Ask your truck dealer to explain how Eaton 2-Speed Axles pay for themselves over and over.

## EATON *2-Speed Truck* AXLES



*Axle Division*

**EATON MANUFACTURING COMPANY**

CLEVELAND, OHIO



PRODUCTS: SODIUM-COOLED POPPET AND FREE VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • JET ENGINE PARTS • ROTOR PUMPS • MOTOR TRUCK AXLES • PERMANENT MOLD GRAY IRON CASTINGS • HEATER-DEFROSTER UNITS • SNAP RINGS • SPRINGTITES • SPRING WASHERS • COLD DRAWN STEEL • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMATIC DRIVES, BRAKES, DYNAMOMETERS

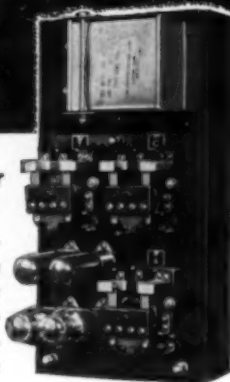
# NEW

## EC&M D-c Sectionalizer

Tests Load-side Intermittently—  
Recloses on **SAFE** Loads

### Simplified Timer in Unit Form

Total over-all interval of "on-off" testing is 15 seconds or more, and is provided by a simple timer having front connected terminals and attached on the front by 2 mounting screws. Quickly removable as a unit. These sectionalizers can be operated without the load-measuring feature—turning manual reset knob on overload relay disconnects timer—allows overload relay to lock-out for manual reset after tripping. Turning knob to original position reconnects timer for automatic operation.



Pulsation-measuring eliminates fire hazards and shock—STUB-END feeders fully protected—production improved.

**S**AFEGUARDS 230, 275 and 550 volt D-c Stub-end feeders *automatically*. Opens on overload, short circuit or voltage failure. Recloses by intermittently pre-testing load side with new circuit of low amperage. Load-measuring voltage less than 50 volts. Feeler current on for 0.8 seconds—off for  $2\frac{1}{2}$  seconds before feeler current is reapplied. Coal dust heated by any arc produced by a fault cools faster than it is heated by the pulses of the feeler current.

There's nothing like these new EC&M Automatic Reclosing Sectionalizers. They accurately discriminate between short circuits and loads of low value. Note, too, the compactness and low headroom construction—ideal for mine service.



Drip-tight enclosure with bull's eye over pilot lamp and hinged cover over push button.

**FOR COMPLETE FACTS, ask for Bulletin 1402 C.**



**THE ELECTRIC CONTROLLER & MFG. CO.**

2698 EAST 79TH STREET

CLEVELAND 4, OHIO

# PARIS MANUFACTURING COMPANY

## Announces THREE NEW DRILLS

The PARMANCO Coal Drill will drill 2½ inch holes at a speed of up to six feet per minute in #5 coal. Equipped with heavy duty truck-type transmission and rear end and a complete hydraulic feed, the drill is operated by one man from the control seat. It is made in two sizes with a 12 h.p. or 25 h.p. gas motor and all units are completely self-contained and enclosed in oil-tight cases.

### ALREADY USED by

Big Bend Collieries, Inc.	1	East Coal Co.	1
United Electric Coal Co.	1	Southwestern Ill. Coal Co.	1
Fairview Collieries Corp.	2	Truax-Truax Coal Company	1
Colonial Coal Co.	1	Stratford Field	1
Little Sister Coal Co.	1	Harbison-Walker Refractories Co.	1
Hans-Glasier Coal Mining Co.	1	Waste Refractories Co.	1
Shawnee-Tomball Coal Co.	1	A. P. Green Fire Brick Co.	1

**THIS UNIT IS DELIVERING 6-INCH SHOT  
HOLES — READY FOR LOADING  
at Better Than Two Feet a Minute ! ! !**

The new PARMANCO Hi-Speed Horizontal Drill is completely redesigned around a 40 h.p. engine with four drilling speeds which, in field tests, has cut one-third off the footage drilling time—a cost-per-drilling-foot saving that we are passing on to the strip mine operator and contractor at no increase in our price. In addition the drill is equipped with a starter and generator, dual type front wheels, truck type rear axle with mechanical brakes and a traction drive with both forward and reverse.

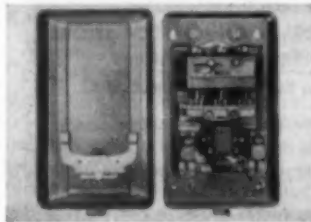
**PARIS  
MANUFACTURING  
COMPANY**  
Paris, Illinois

## EQUIPMENT NEWS—For More Information, Use the Card Facing p 120

specific group of mobile units within a two-way radio system. With a system separated into as many as 10 groups, all individuals in a group hear a dispatcher's call, but when the called party responds all other receivers in the group remain silent. Thus a mobile operator hears fewer calls not intended for him, reducing the number of call backs and repeats and lessening driver fatigue, G-E engineers say. The device attached to the mobile unit is small and weighs only 3 lb and has no moving parts or contacts. — *Commercial Equipment Div., General Electric Co., Syracuse, N. Y.*

### Smaller Respirator Is More Efficient (10)

Redesigned MSA Comfo respirator, for toxic or fibrosis-producing dusts, is USBM approved and features a new type mineral-wool filter which requires less than half the filter area and offers only half the breathing resistance of previous models, the maker says. Filter holders also are smaller in diameter and shallower in depth, permitting more vision from all angles. Maximum wearing comfort is provided with a one-piece headband that may be worn on the neck or head as preferred and a soft pliable cushion-type facepiece which assures a gas-tight seal for a wide range of facial contours. Bulletin CR-26 gives details.—*Mine Safety Appliances Co., Pittsburgh 8.*



### AC Motor Starter Offers New Design (11)

The Clark CY-2 starter for AC motors is said by the maker to introduce a new arc-interrupting principle that is based on the use of strong multi-turn magnetic blowouts with twin break contacts, both combined in economical space. The arc is extinguished by applying the effect of the blowout coil concentric with the contact, with two different actions occurring, changing each half cycle with the reversal of the current. With a forced rotation of the arc, it must continually move from a hot spot to a relatively cool spot, resulting in a highly efficient and extremely effective arc interruption, it is said. No carbonizing of insulating material is possible because all parts in the arc chamber are copper, brass and steel, it is pointed

out, and action of the blowouts assure that any arcing will be spread uniformly over the entire contact surfaces, thus minimizing burning and pitting.—*Clark Controller Co., Cleveland 10.*

### New Rapid Process Copies Drawings (12)

Recently developed XeroX copying equipment now is available for utilization of the new Xerography reproduction process, which may revolutionize present office duplicating methods in speed and economy, the maker reports. Xerography is a dry, direct-positive, electrostatic reproduction process that requires no water, chemicals, film or sensitized materials. An office form, engineering drawing, letter, chart, report or similar material can be copied onto a paper master plate by xerography in less than a minute, it is said. The paper master then is placed on the cylinder of a multilith-process duplicator and multiple copies run off. Operating tests by government and industry organizations indicate sharp reductions in cost and time required over other duplicating methods, it is said. The XeroX equipment, which also can be used to make duplicate single copies, consists of three cabinets fitting on a 3x5-ft table and connected to AC power and may be easily operated by any office worker. Bulletin X-251 from The Haloid Co., Rochester 3, N. Y.



### Centrifugal Pumps Feature Easy Maintenance (13)

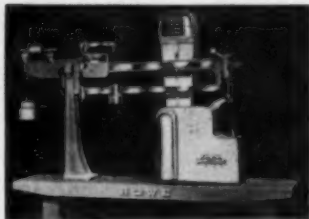
New Rex line of self-priming centrifugal pumps range in size from 1½ to 6 in. with capacities from 4,000 to 90,000 gpm, and is designed for easy and inexpensive replacement of wearing parts. The patented high-carbon-steel air peeler and the open-type impeller assure maximum water handling ability, the maker says. When abrasive wear on peeler or impeller destroys original clearances and pump priming, new pump efficiency can be easily and quickly restored by adjusting the peeler to original tolerance with the impeller. The impeller-shaft seal is never subjected to pumping pressure, so that consider-

ably longer seal life and more trouble-free pump operation is obtained, it is reported. Bulletin 51-27 available from the Chain Belt Co., Milwaukee 4, Wis.



### New Voltage Regulators For Single-Phase (14)

Newest addition to the GE line of dry-type induction voltage regulators, the redesigned single-phase Inductrols in standard ratings of 9.6 kva to 24 kva widen the field of application in which uniform voltage control can be obtained economically with small regulators, it is said. They are available for single-phase circuits, 600 v and below up to 1,000 amp. With standard controls, the single-phase Inductrols can be used for secondary circuit regulation where lighting and power are supplied from the same lines, and for controlling voltage in calibrating and testing meters, instruments and instrument transformers, and other equipment. — *General Electric Co., Schenectady 5, N. Y.*



### Converter For Automatic Beam-Scale Reading (15)

Weighing accessory, Howe 77 Weightograph, attached to any beam scale or to any scale convertible to beam operation, dampens beam swing in an oil dashpot and projects illuminated weight readings on a mirror for wide-angle perception without glare or parallax. The new unit, adaptable to truck scales, uses no springs, gears, friction disks, racks or pinions. The unit is placed on the beam-scale shelf and is connected to the beam by a single rod. Bulletin 668. —*Howe Scale Co., Rutland, Vt.*



**CLEANS**  
sizes and gravities to

**FIT  
ALL  
NEEDS**

From a single washing unit of the Chance "heavy density" Sand Flotation Process, you can produce coal with a gravity range 1.35 to 1.65 and a size range of  $\frac{1}{4}$ " to 10." Adjustment can be readily made at any time to meet any specific requirement, and as readily readjusted for normal production. Also, this equipment gives you:

**High separating efficiency**—great recovery of saleable coal, close to 100%. Also, from a single Chance Process unit you can obtain a low ash product, medium ash product, and a reject product.

**Dependable performance**—steady, uniform, trouble-free operation. Specific gravity of mixture remains constant; efficiency of separation is unaffected by fluctuating loads or changing qualities of coal.

**Easy operation**—change-over from one washing gravity to another can be made in five minutes, simply by opening or closing valves...all under one-man control.

Let the Chance Process help you recover more shipping-grade coal. Get the top prices that top quality coal commands. Our engineers will be glad to cooperate with you in solving any of your coal-cleaning problems.

**CHANCE  
PROCESS**

*the heart of the preparation plant*

**UNITED ENGINEERS & CONSTRUCTORS INC.**

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WITH A BACKGROUND OF OVER SIXTY YEARS' EXPERIENCE

GET THOSE **QUARTERS**  
*Out of Your Coal!*

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**TREATED MINE TIMBERS**

**SAVE UP TO 25¢ PER TON.** This is it! The competitive coal market is back. All operations must utilize every possible cost-cutting device. Why not *BEGIN* where you can save most? Timber represents 40% to 60% of your supply bill. We can cut this cost by making mine timber **LAST LONGER.** You save on timber! You save on replacement! With Osmose you can make any wood species, even beech, gum hickory, ash, elm and maple, into long-lasting timbers.

**1 We can furnish you with  
OSMOSE TREATED TIMBER**

We can supply you with Osmose-treated square-sawed, slabbed or round timbers, ties, collars, posts, lagging, caps, wedges or tipple timbers from one of our treating plants. These select OSMOSE-treated timbers will render many years of **EXTRA** service.

**2 We will CUSTOM-TREAT  
TIMBERS furnished by you**

We will OSMOSE-treat your own timber at our nearest treating plant. Remember, this treatment can be applied to **ANY** wood species, even beech, gum, hickory, ash, elm and maple.

**3 We will furnish MATERIALS and  
YOU can treat your own timber**

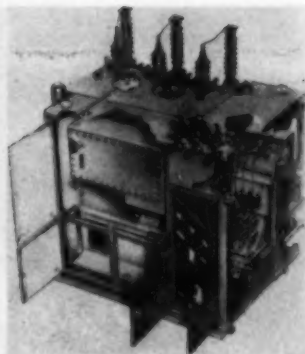
By constructing an inexpensive vat and following directions, you can treat your own green timber with OSMOSALTS.

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**OSMOSE WOOD PRESERVING COMPANY OF AMERICA, INC.**

BUFFALO, NEW YORK

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**Transformers Improved  
For Better Service (16)**

A number of improvements have now been incorporated into all ratings of the Westinghouse CSP transformer to make the units simpler, smaller and easier to ship and service, the manufacturer reports. All standard ratings are "Sealedaire," permitting elimination of the auxiliary compartment, and making more of the tank available for cooling and reducing floor-plan dimensions. Other new features cited by the maker include: reduction in doors and padlocks required so that two padlocks will lock four doors on the front; potential transformers now of the draw-out type to make fuse changing more convenient; elimination of removable frame formerly required for shipping and relocation; and elimination of internal network potential transformers on standard designs to permit added reduction of floor-plan dimensions.—*Westinghouse Electric Corp., Pittsburgh 30, Pa.*



**New Boom Jumbo Cuts  
Set-Up Time (17)**

New drilling jumbo, designed for high-speed drilling in drifts and tunnels is capable of drilling a 12x10-ft face with a single boom, or larger areas with additional booms that may

# Now—Free TRUCK SAVER Inspection

*First step of a complete  
TRUCK SAVER plan*



- Available to all International Truck owners
- No cost, no obligation for a 99-point checkup
- For a limited 3-month period ending September 30



How easily you can keep your Internationals operating at peak efficiency in an uncertain future may depend on what you do within the next 90 days.

If you take advantage of our Truck Saver Inspection, you'll be taking the first step toward putting your Internationals in shape for the "come what may" days ahead.

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So get ready now to keep your trucks on the job despite shortages. The sooner you get your free Truck Saver Inspection, the sooner you see practical reasons why you should take advantage of our complete International Truck Saver Plan.

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The complete International Truck Saver Plan has been developed by experts, after a thorough study of today's truck operating problems. It offers these benefits to International Truck operators:

1. **Better performance** over a longer truck life: trucks are kept in shape to do the most efficient job possible until they can be replaced by new units.
2. **Delays minimized** in getting new parts: by anticipating future requirements, the demand for needed parts can be accurately estimated.
3. **Maintenance costs cut**, down time reduced: by preventing major breakdowns, a big saving is effected in both time and money.

4. **Truck value maintained**: trucks kept in the best possible condition are worth more when it's time for replacement.

## Take advantage of the International Truck Saver Plan now

If you want to save yourself trouble and money in the months ahead, you belong in the International Truck Saver Plan.

Get your free Truck Saver Inspection—find out from your International Truck Dealer or Branch how the plan can help you keep your Internationals going at peak efficiency.

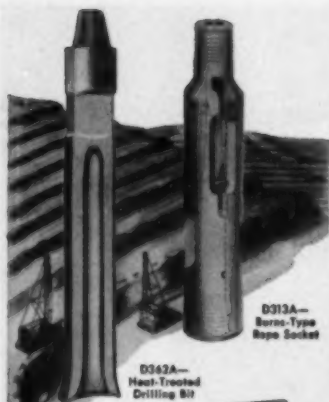
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Tractors . . . Motor Trucks  
Industrial Power . . . Refrigerators and Freezers



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# INTERNATIONAL TRUCKS

*Heavy-duty engineered for the long haul*



D313A—  
Boros-Type  
Rope Socket

D342A—  
Heat-Treated  
Drilling Bit

**For Churn or Cable Drilling of**  
 • BLAST HOLES  
 • PROSPECT HOLES  
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**SAFE • EFFICIENT • ECONOMICAL**

Spang Churn or Cable Tools are top performers in their fields for drilling test holes when prospecting or sampling . . . drilling blast holes for fragmentation of minerals or overburden . . . drilling and reaming escape, dewatering and ventilating holes . . . and drilling wells for other purposes. Fifty years' experience serving oil, water-well, mining and quarrying operations assures their value.

D416—Bosmar-Type  
Pilot Bit



**LARGE BITS**  
for pilot hole drilling and stage enlargement reaming of dewatering, ventilation and escape holes.

D570F—Prefabricated  
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**SPANG CABLE TOOLS**

SPANG & CO., BUTLER, PA.

• SHOT BLAST HOLES • WELL DRILLING  
• PROSPECT DRILLING • SAMPLING

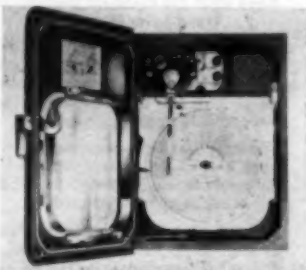
be purchased separately. Boom is raised or lowered by air motor and locked in position by the driving worm gear to prevent creeping, settling or accidental dropping if the air supply is cut off. Boom is swung horizontally

by loosening one nut and locked in position by a double-taper clamp. Two ceiling jacks, 32 tons pressure, hold the jumbo in position, and an additional hydraulic jack is available. — *Ingersoll-Rand Co., New York 4, N. Y.*

## Equipment Shorts You'll Want to Check



(18) **NEW LADDER STABILIZER**, the Hydra-lizer, for the lower end of straight or extension ladders, is said to provide safe, sure footing for ladders in places where the two legs would not be on the same level and can be used on any surface regardless of contour. The two valve-equipped steel legs attached to the ladder automatically adjust themselves to differences in level and are locked into place, supporting loads up to 1,000 lb. — *Mine Safety Appliances Co., Pittsburgh 8.*



(19) **RECORDING VOLTMETERS AND AMMETERS** — New Bristol "Series 500" electric recorders, make a continuous record of voltage or current on an 8-in circular chart. Incorporating an entirely new measuring mechanism, the units have an aluminum-alloy case that is moisture-, fume-, and dust-proof and are available with a variety of mountings and connections. Complete data in 28-page Bulletin E111 from the Bristol Co., Waterbury 20, Conn.

(20) **AN OPTICAL AID FOR WELDERS** who wear bifocal glasses, known as "Weld-Aid Lens," is designed to help operators get full use of bifocal glasses for near vision by supplying clear and unobstructed near vision over the entire area of the window in the helmet, and thus reducing blurred vision and eye strain often suffered by bifocal wearers. Available in two sizes and five powers from *Wilson Products, Inc., Reading, Pa.*

(21) **NEW PLASTIC MAP STICK** simplifies mounting of maps, tracings and blueprints by utilizing snap-on plastic grippers that hold sheets to stick by tension for rolling and storage. No tools, nails or glue are needed and sheets can be readily removed for re-use of stick when desired. — *Ross-Martin Co., Tulsa, Okla.*

(22) **NEW PERMANENT CARTRIDGE DEMINERALIZER** for users of up to 10 gph of high purity water is attached near a tap and is equipped with a flow meter sight indicator that enables the operator to adjust intake flow to the proper rate. Functioning on the ion-exchange principle, the easily removed and refilled permanent cartridge eliminates purchasing expensive new cartridges and screens and thus cuts operating costs at least 25%, the maker says. — *Penfield Mfg. Co., Meriden, Conn.*

(23) **TROLLEY HOIST**—New addition to the Wright Hoist line is the Wright Safeway Army-Type trolley-hoist, available in capacities from 1/2 to 3 tons, with a special load bar and either a pair of two-wheel plain trolleys or one plain and one geared two-wheel trolley. Designed for service where a close headroom assembly is required, it also features high efficiency, light weight and ability to operate freely around minimum radius curves. Bulletin DH-269 gives full details. — *Wright Hoist Div., American Chain & Cable Co., Inc., York, Pa.*

(24) **CHAIN SAW**—New Homelite Model 26LCS, 27-lb 4-hp gasoline chain saw available in either one or two-man units, with blade sizes ranging from 18 to 42 in, offers lighter weight, more power and faster cutting speeds. Design features permit the one-man unit to do the work of a two-man saw, the maker says. — *Homelite Corp., Port Chester, N. Y.*

(25) **FOR SURFACE PROTECTION**

## What's U. S. Rubber doing in the Cumberland Mts.?



A member of the U. S. Rubber belt engineering staff making one of his regular inspections—an established feature of U. S. Rubber's service.

For the last ten years, a U. S. Rubber Conveyor Belt has been carrying run-of-mine coal from the foot of one of the Cumberland Mountains to a tippie. Millions of tons have been carried by the belt since its installation. Yet this "U.S." belt has many years of service remaining, despite its 10-year performance.

This remarkable success story stems from "U.S." 3-Way Engineering, in which representatives of the mine owners, equipment manufacturers and U. S. Rubber belting engineers coordinate their efforts. Invariably the result is lower cost haulage, increased output. Write to address below.

PRODUCT OF



Overall view of installation with 48" wide, 1000' center-to-center belt in the foreground.

**UNITED STATES RUBBER COMPANY**  
MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

# THE WORLD'S LEADING SINGLE ROLL

## for Coal Crushing at Mines

- Low Headroom
- One-Piece Steel Roll
- Automatic Tramp Iron Release
- Minimum Fines
- Won't Plug with Wet or Frozen Feeds

If you need a *compact, non-clog* crusher to reduce ROM, you'll get the lowest-cost, most reliable service from a Pennsylvania Single Roll Crusher. Under 4 feet high, it doesn't require a big, expensive installation. Power demand is *low*— $\frac{1}{2}$  HP, or less, per ton. And the cast steel roll is *one-piece*—no bolted segments, no renewable teeth to work loose or freeze up. The roll stays *in* the crusher where worn teeth are built up by welding—a quick, *single* operation that cuts maintenance costs and out-of-service time.

What's more, Pennsylvanias won't plug with wet or frozen feeds—roll teeth are vari-height and staggered, take positive bites from the sloppiest ROM. Also, by a patented toggle action, the breaker plate automatically moves aside to pass tramp iron and mine timbers that might wreck many crushers. For the most efficient, economical, dependable Crusher, investigate Pennsylvania's Single Roll. Capacities range from a few tons per hour up to several hundred TPH. Easily adjusted for product size from  $\frac{3}{4}$ " to 8" (nominal). When crushing coal only, use Type "K" (Bulletin 2006). Where refuse must also be handled, we recommend the use of the heavy duty Armorweld (Bulletin 2011).

### PENNSYLVANIA CRUSHER COMPANY

Division of Bath Iron Works Corporation  
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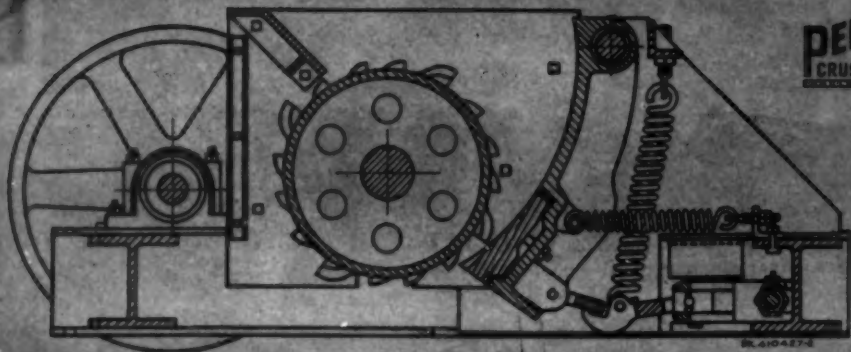
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## PENNSYLVANIA

### SINGLE ROLL CRUSHERS

Single Roll Crushers are available in capacities from 100 to 1000 TPH. They are available in standard and heavy duty designs. They are available in standard and heavy duty designs. They are available in standard and heavy duty designs.

**PENNSYLVANIA**  
CRUSHER COMPANY



of steel and iron, new Zinkrich cold-galvanizing compound is said by the maker to create a highly effective electro-chemical union, thus allowing zinc to become galvanized to the base metal's surface. It is applied with an ordinary paint brush, electric spray gun or cold dip and no special equipment or personnel training is necessary.—Chase Chemical Corp., New York 1.

**(36) WORM AND GEAR-OPERATED VALVES** added to the Homestead-Reiser lubricated plug valves feature the patented "Self-Seal" construction, a port area equivalent to 100% of the area of standard pipe. They are cast in semi-steel in 8-, 10- and 12-in sizes and will soon be available also in cast-steel full-port type and in venturi-type sizes up to 14 in. Full details in Book 39-5 from Homestead Valve Mfg. Co., Coraopolis, Pa.

**(37) TACHOMETER INDICATOR** designed for a particularly wide range of speed measurement, the Metron Series 42P, can be used with any series Metron Tachometer Head, and features simple rotation of the indicator range knob to select one of three speed ranges to measure any speed over a total range of 40 or 50 to 1. Scales are supplied for direct reading in any units such as rpm, fpm, in, sec, etc., and with ordinary open wires the indicator can be located up to 1,000 ft from the head.—Metron Instrument Co., Denver 9, Colo.

**(38) NEW CONCRETE HARDENER**, called "Flintcrust" liquid, converts a "caked" concrete floor into a case-hardened concrete floor capable of long and maintenance-free service under oil, grease and penetrating, discoloring and disintegrating conditions, as well as heavy abrasive truck traffic, the maker reports. It counteracts and prevents sanding and eventual surface breakdown, and is easily applied by flushing, without interrupting normal plant operation. Details from Fluorocast Co., Philadelphia 4.

**(39) FOR CORROSION PROTECTION** of boilers, tanks, valves, pumps, pipes and other metal surfaces subject to deterioration by water, water vapor, acids and gases, etc., newly announced "Corrosanti" is available in four types prepared for different applications. It is said to be easily applied, even under water, on a wide variety of surfaces. Detailed data from Dr. Adolph Scherer, 55 Cambridge St., East Orange, N. J.

**(40) ELECTRIC HAMMERS**—Now being introduced in the U. S. for the first time, the 25-yr old Kango electric hammer line consists of three sizes, including a heavy-duty hammer 22 in long, weighing 21 lb and striking 1,300 blows per min, which is said by the maker to be pound for pound the most powerful electric hammer made. The line includes 53 different

**YHM-1 would like more information . . .**

Please send me catalogs or further information about the items from the Equipment News Section whose numbers are circled (July, 1951)

1	6	11	16	21	26	31	36	41	46	51
2	7	12	17	22	27	32	37	42	47	52
3	8	13	18	23	28	33	38	43	48	53
4	9	14	19	24	29	34	39	44	49	54
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In addition, please send me data on these OTHER products advertised in this issue (give name and page number)

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Company \_\_\_\_\_

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## USE THIS CONVENIENT CARD

... TO GET MORE INFORMATION on products and bulletins mentioned in this Equipment News Section or for data on any product advertised in this issue. Circle item numbers, tear out and mail.

tools and 119 additional variations of them. Design features are said to permit faster production, less fatigue to operators, and longer service. Catalog from Allied Tools, Inc., Newark 4.

**(41) BOSKOTE**, corrosion-resistant coating for triples, buckets, piping, pump parts and other mining applications, is unaffected by temperatures from sub-zero to 180 deg, will not oxidize, check or scale; resists vibration, distortion and bending, and can be readily removed by petroleum solvents when necessary, the maker

states.—Registon Laboratories Inc., Houston, Pa.

**(42) WAREHOUSE CLEANER**, Saf-T-Klean, removes soap oil, body grease, algae, lime deposits and rust to make floors practically slip-proof and minimize infectious conditions, the maker declares. In use, the powder is sprinkled on a damp surface, mopped lightly and flushed with clear water. Saf-T-Klean is harmless to hands, clothing, floor and drains, and is odorless. Free sample on request.—Berman Chemical Co., Toledo 4, Ohio.

## EQUIPMENT BULLETINS AVAILABLE

**(43) IF MAIN-LINE HAULAGE** is one of your problems, you'll be interested in a booklet offered by Sunford-Day Iron Works, Knoxville 9, Tenn. Discussing how "continuity, flexibility, balance and economy" can be obtained in coal mining, the booklet analyzes factors in the application of automatic drop-bottom coal cars used with surge bins, along with other types of coal-haulage systems.

**(44) NEW LOADING MACHINE**, Goodman Type 860 designed for high-capacity trackless mining in very low coal, is described in Bulletin CLT-514 now available from the Goodman Mfg. Co., Chicago 9. Operating and construction features and application possibilities are covered in detail.

**(45) ROOM CONVEYORS**—Bulletin LD-800, recently released by Joy Mfg. Co., Pittsburgh 22, Pa., describes in detail its new line of Model FA chain-

and-flight room conveyors. Three new chains for FA conveyors are also included in the 5-p booklet, with dimension prints and specifications.

**(46) TRACTOR EQUIPMENT** for Caterpillar diesel tractors described in Catalog 1106 issued by the Tracton Co., Milwaukee 1, includes five models of Traxcavator tractor-shovel units, pipe layers, earth augers, TracLoaders, swing cranes and land-clearing equipment, with specifications for each.

**(47) MOBILE MINE-TYPE AIR COMPRESSORS** are featured in the new 24-p Bulletin A-53 now available from Joy Mfg. Co., Pittsburgh 22. The booklet covers 29 sizes and models of the Joy two-stage air-cooled Mine-Air compressors, including track-mounted or rubber-tire mounted, tow-bar or self-propelled type, and boom-mounted units for mine mounting.

FIRST CLASS  
PERMIT NO. 66  
(Sec. 349, P.L. 82)  
NEW YORK, N. Y.

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### EQUIPMENT BULLETINS AVAILABLE—Cont'd USE POSTAGE-FREE CARD ABOVE

(54) DUCKBILL — New Goodman Duckling, a short lightweight loading head for shaker conveyors designed particularly for light work in anthracite mining and featuring loading performance up to 35 tph, is described in Bulletin CC-515 offered by the Goodman Mfg. Co., Chicago 9.

(57) ELECTRIC MOTORS — Allis-Chalmers improved totally-enclosed fan-cooled motors with tube-type air-to-air heat exchangers available in squirrel-cage, wound-rotor and synchronous types for both horizontal and vertical installation, are featured in Bulletin 05B7150A available from Allis-Chalmers Mfg. Co., Milwaukee 1. Ratings, construction and application features are thoroughly covered.

(58) DRILL BIT RETRIEVER — Folder describes the recently announced Rock Bit "Hole Saver," designed to save both bit and hole by reclaiming lost bits and drill steel. Available from Rock Bit Sales & Service Co., Philadelphia 25.

(59) UTILITY TRUCK — Bulletin CC-513 issued by the Goodman Mfg. Co., Chicago 9, covers the new Type RHT-3 tractor-tread utility truck especially built for short-haul underground service in transporting shortwalls, shaker drives and troughing, belt and chain conveyor parts and other supplies and equipment.

(60) COAL - ANALYSIS EQUIPMENT — Central Scientific Co., Chicago 13, offers a new 12-p Circular DET1 listing suggested apparatus and chemicals for standard methods of laboratory sampling and analysis of coal and coke according to ASTM DFTL.

(61) MINE FANS — Joy Mfg. Co., Pittsburgh 25, offers a new Bulletin J-609 illustrating its line of Series 1000 Axifane mine fans for intermediate-pressure installation. A di-

mension drawing and selection table included permit approximation of fan requirements.

(62) A POWER-FACTOR VISUALIZER that presents a simple explanation of the use of capacitors in solving low power-factor problems is available from the Westinghouse Electric Corp., Pittsburgh 30. Prepared in the form of a slide-rule-type chart, Chart SA-6789 explains just what low power factor is, what it means to both the power user and the power supplier, and what benefits can be obtained by improving the power factor through the installation of capacitors.

(63) ELECTRIC MOTORS — Bulletin from Wagner Electric Co., St. Louis 14, illustrates the various types, sizes and models of Wagner single-phase and polyphase motors, with brief descriptions of ratings, characteristics and features.

(64) MAGNETIC SEPARATORS — Erie Mfg. Co., Erie, Pa., has available a new 16-p Catalog 15 on "Non-Electric Permanent Magnetic Separators for Tramp-Iron Removal," which presents complete descriptions of separators, engineering data, and information on the selection of appropriate units.

(65) CENTRALIZED LUBRICATION — Bulletin 680 on controlled lubricant application systems for the mining industry thoroughly explains the use of Lincoln centralized lubrication systems on underground mining machinery; strip mining and tipple machinery. Available from Lincoln Engineering Co., St. Louis 26, Mo.

(66) ROLLER BEARINGS — Engineers and others specifying industrial roller bearings and mounted units will find a copy of the new 56-p Shafar Catalog 51 of value. In addition to extensive engineering and load-rating

data, the book illustrates and describes the full line of Shafar products, including pillow blocks, flange, flange-cartridge, cartridge, duplex, take-up and take-up-and-frame units, plus unmounted roller bearings. It is available from Shafar Bearing Corp., Downers Grove, Ill.

(67) AIR COMPRESSORS — Bulletin H-450-B73 describes the Blue Brute 160 portable air compressor, with detailed operating and specification data, features and mountings available. Offered by Worthington Pump & Machinery Corp., Dunellen, N. J.

(68) LUBRICANTS — Application of the Phillips heavy duty line of gear oils and lubricating greases for various types of heavy duty and special-service requirements in trucks, heavy tractors, power shovels and other earth-moving machinery is covered in detail in a 36-p bulletin entitled "Oil for Engines of Commerce" available from the Phillips Petroleum Co., Bartlesville, Okla.

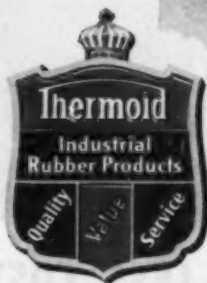
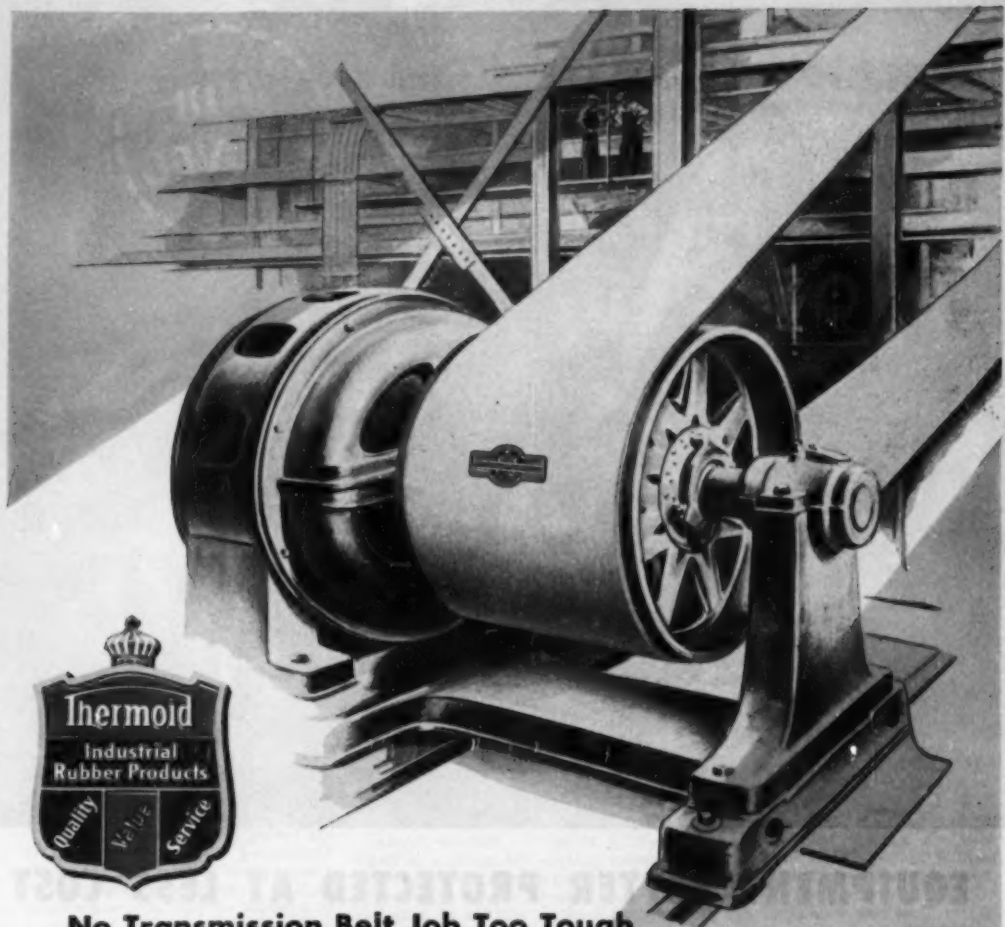
(69) PROTECTIVE EQUIPMENT for welders shown in a folder issued by Wilson Products, Inc., Reading, Pa., covers a wide range of eye-protective devices for both gas and arc welding, respiratory protection and accessories.

(70) BETTER INDUSTRIAL LIGHTING and the three ways it can produce better results for management are thoroughly discussed in a new 16-p lighting-at-work Booklet B-4787 available from the Westinghouse Electric Corp., Pittsburgh 30. Emphasizing that different operations in a plant call for varying amounts and types of light, this booklet analyzes the three modern light sources as to type of light-efficiency, lamp life, maintenance, mounting height and job suitability and also covers special lighting for special areas.

(71) HOSE CLAMPS AND FITTINGS — Catalog 200-50 on hose clamps, tools, and fittings prepared by the Funch-Lok Co., Chicago 7, describes the Funch-Lok method and its many applications, not only for making leakproof hose connections on almost any type of hose but also as a low-cost solution to a wide variety of other clamping and banding problems, such as splicing electric cable, repairing leaks in pipe lines, clamping guy-wire guards and other miscellaneous repairs.

(72) FIRE-EXTINGUISHER GUIDE covering its complete line of portable and special-purpose fire extinguishers and providing an easy-to-use chart for selecting the right extinguisher for every type of fire hazard is available from Stop-Fire, Inc., Brooklyn 1, N. Y.

(73) STOKER FEEDER — Circular from the American Coal Burner Co., Chicago 11, discusses the Flo-Matic stoker feeder screw conveyor designed to save fuel-handling costs in industrial boiler-room installations of various types.



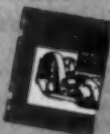
## No Transmission Belt Job Too Tough ... For Thermoid

Have you some really tough transmission jobs—regular belt killers? They won't be too tough for a Thermoid Transmission Belt. Let your Thermoid Distributor prove that by furnishing exactly the right belt for your job.

For general service he will offer "400", the all-purpose belt that will satisfactorily service all normal operating requirements.

For severe service, or for high speeds with small pulleys, he will recommend Thermoid High Speed "R", made with extra strong, hard 35-oz. duck and top grade rubber. Where there are oil or fumes injurious to rubber, he will recommend Thermoid High Speed "N", with Neoprene friction and skid. Each type is practically custom-built for the service for which it is recommended.

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Conveyor & Elevator Belting • Transmission Belting  
F.I.P. & Multiple V-Belts • Wrapped & Molded Hoses

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## EQUIPMENT BETTER PROTECTED AT LESS COST

### **Sun Mine Grease Again Proves Its Superiority, Keeps Loaders Working—Builds Up the Profits**

This loader, one of 36 in a western Pennsylvania mine, can fill a 5-ton car in a couple of minutes. That's action, and it takes more than an ordinary grease to protect the bearings and drives.

At first the mine used a product that formed gummy deposits in the bearing-grease reservoir. This kept fresh grease from reaching the bearings and caused excessive wear. Subsequently other products were

tried out—with somewhat better results. But in every case the price was higher than good business-judgment could approve.

Next the mine turned to a "Job Proved" Sun mine grease, known to many producers for its performance plus economy. In over 18 months there has not been a single breakdown due to lubrication, even with the equipment occasionally overloaded. Much of the time the

loaders run at top capacity. Output is high—and profitable. Grease costs are low.

There are "Job Proved" Sun mine oils and greases for every lubrication need, whether in producing, transporting, or processing.

Wherever used, these products are contributing to economical operations. Call in your nearest Sun Industrial Products man for consultation on your problems.

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**SUN PETROLEUM PRODUCTS**  
"JOB PROVED" IN EVERY INDUSTRY





## 1951 Coal Production Expected to Top 1950

Even if the output of bituminous coal for the last 7 mo of 1951 is no more than it was in the last 7 mo of last year, total 1951 production will be about 545 million tons, as compared with the 1950 total of 512 million tons, the National Coal Association pointed out last month. Estimated output for the first 5 mo of 1951 was 222,150,000 tons, compared with about 189 million tons in the same period of last year.

While limited market demand has resulted in restricted working time in various areas during recent weeks, considerable strengthening of markets during coming months appears quite probable, a study of various factors indicates. For one thing, the defense program is slated to be stepped up materially during the last half of 1951, with defense spending by the government expected to increase from about \$2.5 billion a month to some \$4 billion monthly. Production of many commodities has barely started and there are some factories which will burn coal that are still being built.

Summer stockpiling has gotten off to a slow start, but with government support of this program and prospects of a transportation shortage this fall, increased activity may be expected, it is reported. The higher OPS ceiling prices for residual fuel oils along the Atlantic Seaboard announced last month also are expected to have a healthy effect on coal demand. Boosts of 17 to 31c per barrel to cover increased tanker transport costs were permitted "to assure a 'safe' supply of residual fuels oils for expanding defense industries and for the health and comfort of domestic users next winter."

Shortages of natural gas are expected in some areas next winter and in some cities further gas installations have been prohibited. The government also is reportedly planning to purchase some 7 million tons of coal to supplement the 11 million tons already ordered.

Recently, in emphasizing the importance of summer stockpiling to avoid rail tieups this fall, C. W. Conner, DSFA Administrator, estimated that demand for bituminous coal might run as high as 580,000,000 tons during 1951 (see *Defense Developments*, p 137 of this section).

## News In Brief

### NLRB Acts on Pa. Organizing

The National Labor Relations Board June 7 ordered District 2, UMWA, to cease and desist coercing employees of four Armstrong County, Pennsylvania, coal companies by threatening them with force and violence. The NLRB found that the UMWA and four of its agents had engaged in unfair labor practices while attempting to organize these non-union mines and required the union to post notices that it would cease such practices. In another action, brought by the PMWA, the NLRB recently was upheld by the 7th Circuit of Appeals in its refusal to exercise jurisdiction in a case involving a small coal mining company whose sales were all made locally and whose indirect outflow, through local sales to customers engaged in commerce, was less than \$50,000 annually.

### Coal First in Home Heating

Almost one-half of the 20 million dwelling units in the country having central heating are heated with coal, 1950 Census figures released June 10 indicated. In addition to the 9,430,000 centrally heated units using coal, there were 5,127,000 other dwelling units burning coal in various types of space heaters, the Census Bureau reported. Manufactured and natural gas was used in 5,914,000 centrally heated units and liquid fuel in 5,130,000. For units with and without central heating, the total for gas was 11,795,000 and for liquid fuel, 9,115,000.

### Legislative Inquiry Extended On Closing Bell & Zoller Mine

The life of the Illinois legislative committee probing the cause of closing of Mine No. 15 of the Bell & Zoller Coal & Mining Co. Mt. Olive, was extended for 2 wk to June 15 after its members asked for more time to complete their inquiry. The probe was voted in mid-May on demands of PMWA officials, charging that the mine had been shut down earlier in the month "without warning or explanation." In testifying before the committee June 6, A. M. Rogers, president of Zeigler Coal Co., said Mines Nos. 7 and 15 were "losing mines all the way through," and that the company had expected to sell them when they were purchased from Consolidated Coal Co. earlier this year. After sale arrangements "fell through," it was decided to close one of the two because both were losing money with only 2 days work apiece and all the coal acreage could be served by one mine. Earlier, William P. Young, Bell & Zoller, president, had told the committee that the mine had lost its market and could not be sold.

### Miners' Strike Backs Clerks

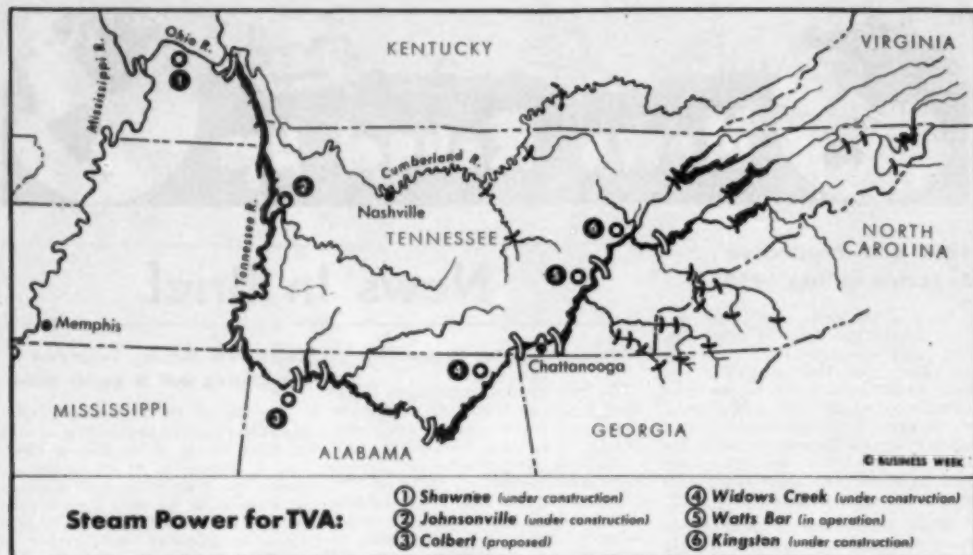
Some 3,000 UMWA members employed at mines of the Clinchfield Coal Corp. in southwestern Virginia ended June 4 the work stoppage they had started the week before in support of 100 company mine clerks seeking recognition. The clerks are reportedly members of the United Construction Workers, a UMWA affiliate. The company had indicated that it would negotiate with the UCW if its miners returned to work, according to reports.

### Organizing Drives Continue

About 40 arrests of union members had been made as a result of the UMWA drive to unionize some 30 small mines in Wise County, Virginia, and no end of the tension in the area was in sight, it was reported June 10. Between 150 and 200 pickets continued to rove the area picketing

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## COAL WANTED

OVER 8,000,000 tons will be needed by 1954 to fuel six steam plants now in operation, under construction or proposed by the Tennessee Valley Authority. Electric-power demand of booming atomic-energy plants, plus new power-using industries and growing farm mechanization, have pushed hydroelectric generation up to the ceiling. That's why TVA is turning to steam. When TVA's present program is completed, more than half of its 6,000,000-kw capacity will be steam generated. At maximum load, coal use may run as high as 9,700,000 tons per year.

different mines each day, and state police were on constant patrol to preserve peace. The wife of a non-union operator was arrested May 31 on charges of shooting at pickets parked in front of her home and the following day swore out charges against two of the men for attempted murder. Dynamiting of a sub-station supplying one of the mines was reported May 31. In Pennsylvania, a truckers organizational drive by District 50, UMW, had, for the moment at least, stopped practically all movement of industrial coal by truck in the Charleroi-Monessen area. It was reported June 1. The 2-wk work stoppage over seniority questions at EG&FA Federal No. 1 mine Grant Town, W. Va., appeared at an end June 3 as the 1,100 members of Local 4047 voted to return to work and discuss the grievances with the company.

### Natural Gas For Oak Ridge Upheld by Court Decision

The Federal Power Commission's order authorizing construction of a 172-mi pipeline to supply natural gas to the atomic energy plant at Oak Ridge, Tenn., was upheld June 18 by the U. S. Court of Appeals in Washington. The project had been opposed by the NCA, UMW, railway unions and others. The switchover from coal was necessary to prevent the plant being shut down in the event of a prolonged coal strike, proponents had

said. In the unanimous decision, the court said that if the union and operators lose business "it is largely because of their own antics in creating frequent crises by way of strike or threats of strikes."

### Ohio Coal Pipeline Approved

The bill providing public utility status for pipelines carrying coal in Ohio was signed into law by Gov. Lausche early last month. The bill, which was necessary to facilitate construction of long-distance pipelines, becomes effective Aug. 25. The Hanna Coal Co. Div. of Pittsburgh Consolidation Coal Co. is currently building a 3-mi experimental line for the transport of pulverized coal at its Georgetown stripping (Coal Age, March, p. 127).

### And for Your Information . . .

Western Kentucky bituminous coal will be used to produce 330,000 gal of synthetic oil from which a similar quantity of high-octane gasoline will be secured for testing in army vehicles, the USBM has reported. The project will be carried on at the Bureau's coal-hydrogenation demonstration plant at Louisiana, Mo., which recently completed a test run using 2,600 tons of Kentucky coal.

The Virginia Coal Operators' Association has made available a \$300

scholarship in mining engineering at Virginia Polytechnic Institute beginning this fall. The scholarship is renewable through the 4-yr course if the student receiving it maintains a good academic record. Nominations must be made by July 15.

Some \$235,000 needed for a new wing at Miners' Hospital, Spangler, Pa., will come from the estate of John S. W. Holton, president of the Sterling Coal Co. for 39 yr, who died in 1947. Trustees of the estate recently donated the money after community pledges of \$120,000 and state aid of \$236,000 fell short of the required total.

The Lake Superior Coal Co., Superior, W. Va., has received a plaque for its accomplishment in a state-wide payroll defense bond program. The company was cited for maintaining more than 55% employee participation since a payroll savings plan was inaugurated in 1942. The award was donated by T. E. Millsop, president of the Weirton Steel Co.

The Sunnyhill Coal Co., Pittsburgh, filed suit May 24 in the Columbus, Ohio, federal district court against the Jeffrey Mfg. Co., seeking to set aside their joint enterprise for the manufacture and sale of the Colmol and the recently introduced Molveyor. Sunnyhill also asked for \$20 million in damages, and charged in the suit

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Air hose economy is not measured in feet per dollar. The only true yardstick of air hose value is *service hours*.

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tested and field-proven to give the best possible combination of strength, safety, flexibility and damage resistance... *you get maximum service life.*

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### CONCORD AIR



An extra quality, exceptionally rugged hose for toughest use on air drill and pneumatic service in mines, quarries and construction jobs. Non-porous tube resists heat and oil. High tensile cotton yarn braid reinforces carcass. Tough grey cover resists cutting, gouging, abrasion. Made in 1/2" 2-braid and 3/4" 2-braid sizes. 200 to 300 lbs. working pressure. Maximum length 50'.

### BAY STATE AIR DRILL



For heavy construction work in mines, quarries, tunnels and wherever large size hose is required for long service. Smooth black tube resists heat and oil. Carcass of strong, rubber-impregnated multiple ply woven duck. Rugged, heavy-gauge red rubber cover resists severe weather extremes, cutting, abrasion. 9 sizes stocked from 1/2" to 4". Working pressures from 175 to 225 lbs. Maximum length 50'.

### AUROCHS AIR



For portable air compressors, jackhammers, rugged industrial and construction work. Smooth, black, non-porous tube resists heat and oil. Carcass: multiple ply, rubber-impregnated, rugged woven fabric. Tough black cover resists weather and abrasion. Stocked sizes: 1/2", 3/4", 1", 1 1/2", 2" 200 lbs. working pressure. Maximum length 50'.

### VIM AIR



For general industrial use, on compressors and pneumatic tools. Black tube resists oil and heat. Hunky cotton yarn braid. Smooth, red cover resists weather, abrasion. 8 sizes stocked, 1/2" 2-braid to 1 1/2" 3-braid. Working pressures 150 to 225 lbs. Maximum length 500'.

### BULL DOG VARI-PURPOSE AIR



For a variety of jobs including handling of air, water, oil, gasoline, kerosene (not for paints, lacquers, lacquer-solvents). Black, synthetic tube resists oil and heat. Carcass is braided rayon cord, high strength, super flexible. Smooth, brown, tough synthetic cover resists oil, abrasion, sunlight. 11 sizes stocked from 3/16" one-braid to 1 1/2" 2-braid. Working pressures 200 to 300 lbs. Maximum length approximately 500'.



## BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all Principal Cities

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P. O. BOX 1071, BOSTON 2, MASS., U. S. A.

# The 1951 COAL SHOW

Organized by a Face-Machine—



Old man, why—super slow



Piece of coal—let's see if it's good



Hurry, hurry to see the latest model machinery—



How long—how long will you be out there?



You can't hurry things—your computer doesn't say so



By the way—this—this—this is a complete set



Old man—You see, this—this—this is the best



If you don't see these new models—this is all the machinery



By the way—this—this—this is a complete set



Old man—You see, this—this—this is the best



If you don't see these new models—this is all the machinery

that Jeffrey had been too slow in producing and marketing the machines.

Coal movement on the Great Lakes during 1951 will total some 47 million tons, as compared with 53 million in 1950. W. J. McGarry, manager of the Ore & Coal Exchange, estimated last month. Diversion of 2,500,000 tons to all-rail haulage, reduction of demand by 2,500,000 tons because of carry-over from 1950 stocks, and the routing of another 1,500,000 tons to points on Lake Michigan and Superior were responsible for the expected decline, he said.

With the sale of its telephone system, the Consolidation Coal Co. (Ky.) Div. of Pittsburgh Consolidation Coal Co. has disposed of its last remaining utility and is now exclusively in the coal business, it was reported June 4. The company originally owned all utilities in the Jenkins area, as well as business property and housing which it has sold over several years.

Jones & Laughlin Steel Corp. filed suit June 13 in a Pittsburgh federal court against F. H. McGraw & Co., asking \$3,301,375 damages for breach of contract under a 1947 agreement for construction by the McGraw com-

pany of the J&L coal-washing plant at Vestaburg. The McGraw organization was to complete the plant by July 8, 1949, it was stated, but failure to do the work properly, the suit maintained, compelled J&L to take over the job in 1948. J&L had to keep other plants operating and also had

## Lewis Re-States His Faith in Coal, Outlines UMWA Aims and Policies

JOHN L. LEWIS, president, UMWA, recently told a group of visiting German coal technologists that he sees a long-term prosperous future for the American coal industry. He took occasion also to explain to his visitors the policy and aims of the mine workers' union. The following paragraphs are taken from the June 1 issue of the UMA JOURNAL, which reported Mr. Lewis' remarks.

COAL'S FUTURE—"We have no fear for the future of the coal industry in this country. From the standpoint of stable investment and modern mining operations, attractive inducements are offered investors on a long-term basis. . . . Our economy

to buy coal as a result, the suit claimed.

Government stockpiling of 11,000,000 tons of anthracite would be authorized in a bill introduced in the House May 15 by Rep. Flood of Pennsylvania. The bill is the same as one he introduced last year, which died in committee.

The Strip Land Committee of the Pittsburg (Kan.) Chamber of Commerce is sponsoring a series of contests open to the public using strip land lakes in Crawford and Cherokee Counties. Monthly cash prizes and grand prizes are being awarded for the largest fish of several types caught from June through September, and prizes also are to be given for the best fish photo and the best fishing story, "true or otherwise."

## New Coal Customers?

Twenty-nine electric-power plants to cost over \$300,000,000 in six states have obtained certificates of necessity from Defense Production Administration and have been granted 5-yr. tax write-offs to speed construction.

Biggest of the projects is one that will cost \$42,789,750, to be built at Detroit by Detroit Edison Co. Others are as follows:

- Detroit Edison Co.—One plant in St. Clair County and two others in East China Township, Mich., totaling \$78,000,000.
- Mississippi Power Co., Gulfport—Two plants costing \$12,000,000.
- Alabama Power Co., Birmingham—Five plants costing \$33,400,000.
- Pacific Power & Light Co., Portland, Ore.—One plant costing \$26,450,000.
- Virginia Electric & Power Co., Richmond, Norfolk and Gilmertown—Eight projects totaling \$53,000,000.
- Georgia Power Co.—Seven plants costing \$40,000,000.
- Gulf Power Co., Pensacola, Fla.—Two plants totaling \$20,000,000.

is a coal economy and will remain so. . . . The oil, gas and hydroelectric industries are not displacing coal as such. They are stopping coal from taking advantage of increasing demands for fuel values. . . . The normal consumption of coal by the United States is greater now than at any time in its history."

MECHANIZATION AND WAGES—"If a new machine lowers costs, the mineworkers want participation in it. We don't believe that God put an idea in the mind of an inventor for the sole advantage of a coal company. . . . The only way our free-enterprise system can endure is to have a continuing participation in the increasing values that come from increased per-man-day productivity. . . . The mine-

# HAULING UNDERGROUND ... CUTTING OVERHEAD

## QUAKER CONVEYOR BELTING



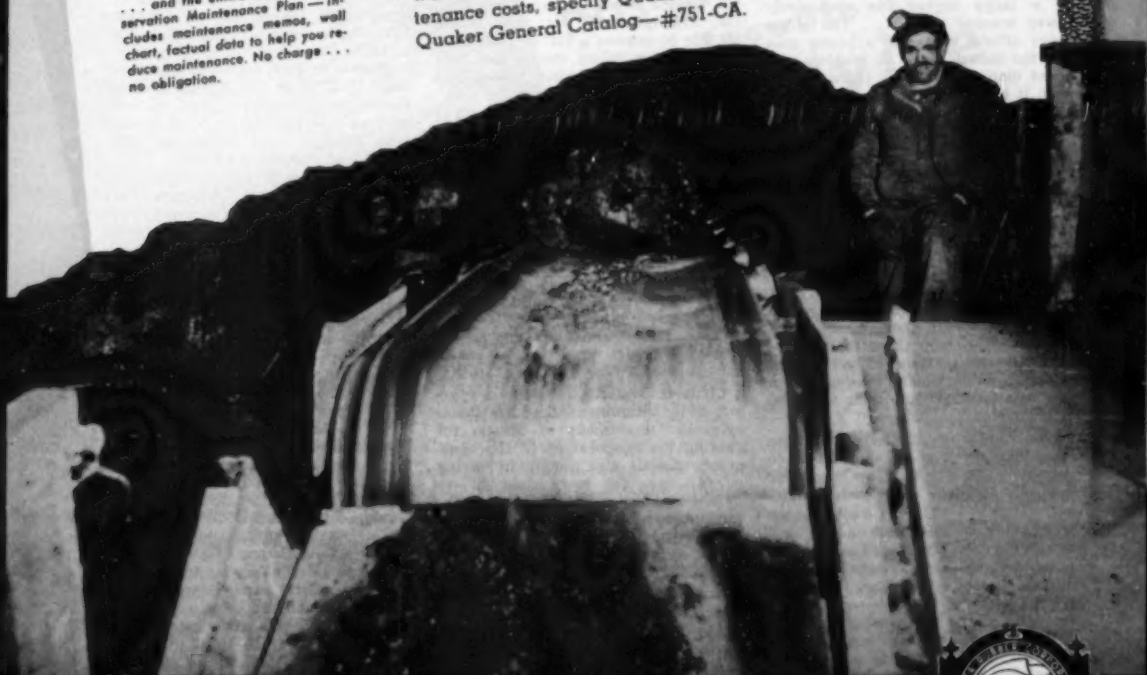
FOR MORE PRODUCTION  
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... and the entire QUAKER Conservation Maintenance Plan — includes maintenance memos, wall chart, factual data to help you reduce maintenance. No charge ... no obligation.

### *Stands Shock ... Resists Wear ... Cuts Maintenance*

At Carbon Fuel Corporation's mine, Carbon, West Virginia, large lumps of sharp, jagged coal and slate drop with a terrific impact from a height of ten feet from the entry belt to the 2500 foot main line Quaker conveyor belt. Ton after ton of material has been hauled without noticeable wear, tear or failure. That's how Quaker Belts stand up and take it!

Quaker Conveyor Belts are scientifically made to prevent internal friction while flexing ... to stand terrific external shocks and abrasion. Pre-testing assures belts that defy wear and separation. Above or below ground Quaker has the rubber product to speed production and cut overhead: flat transmission and V-belts; air, water, and steam hose; sheet packing. To economize on maintenance costs, specify Quaker. For full details, write for the new Quaker General Catalog—#751-CA.



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## Lewis States Aims . . .

workers are not taking money out of the public pocketbook or out of the private citizen's purse. They are taking it out of the productivity and the new values that they helped to create. . . .

"We want participation. . . . We ask for it before the operator gets it, thus to compel him to modernize."

**NEW MACHINES**—"We decided it is better to have half a million men working in the industry at good wages, high standards of living, than it is to have a million men working in the industry in poverty and degradation. We have not displaced men very rapidly in the industry through mechanization. We have merely slowed down the absorption of new employees."

**MANPOWER** — "Mechanization merely resulted in less young men being absorbed into the industry through the years as the older men retired through age, disability or impaired health. . . . We hold that whatever the number the industry employs, it should pay them a decent wage for the services they render. . . . Union advances have made the job sufficiently attractive to bring enough young men into the mines to man the modern machines and have eliminated to a large degree the excessively heavy manual labor. . . . The mines today offer a career to a young man and the industry has no problem now about manpower. And I think we can keep it that way."

**SAFETY**—"Our injuries are far too high. . . . Safety is one of our major problems and we are fighting our way day by day on it. We do what we can against the inertia of the industry."

**UNION - MANAGEMENT SPHERES**—"We do not want the responsibility of management. We want the people who put their money into it to worry about management problems. We can help them to decide—at times—on matters of policy and principle, without being burdened with the responsibility of their detailed management problems."

"We hold that if you change the form or concept of a labor union so that it becomes either an owner or management of a commercial enterprise, then it is no longer a labor union with the mobility, freedom and strength to enforce economic pressures. . . . If a union became a co-manager of an industry, which would come first—the requirements of that company or the interests of the union members? The UMWA could enter the coal business if it wished to do so, but we wouldn't be a labor union when we were doing that. We'd be another commercial, competitive enterprise. And the policies of the UMWA would have to be suited to its financial obligations."

## Annual Holmes Safety Awards Honor Individuals and Mining Companies

TWO OF THE SIX MEN awarded Medals of Honor by the Joseph A. Holmes Safety Association were coal mining men who were honored for individual deeds of heroism in saving life at the risk of their own, it was announced May 14 by James Boyd, director, USBM, and president of the Association.

The Association, which was formed in 1916 to commemorate and further the work of the late Dr. Joseph A. Holmes, first director of the Bureau, also approved 313 Certificates of Honor for exceptional safety records and outstanding success in supervisory work in the various mineral industries of the country. Of these, awards went to 82 coal mines and companies and to 87 individuals, 76 of whom were engaged in coal mining.

Recipients of the Medal of Honor included: Walter Legins, a shaftman at the Bliss colliery of the Glen Alden Coal Co., Nanticoke, Pa., who was lowered several hundred feet into a pit following a caving of the sides to rescue a fellow worker; and C. K. Merrifield, a section foreman at the No. 3 mine of the Valley Camp Coal Co., Tridelpia, W. Va., who risked his life to remove a fall of rock from the legs of a fellow worker and help him to safety. Another miner was killed in the same accident.

For promoting safety in mining and for supervising the work of others, the following individuals received Certificates of Honor:

Thomas M. Beane, state mine inspector, 11th Anthracite Inspection District, Pennsylvania Department of Mines, for having no fatalities in the district under his supervision during the year 1950, with an average of 3,486 employees, working 5,696,589 man hours, producing 1,639,335 tons of coal. This is the first time an inspection district in Luzerne County has operated a year without a fatality.

Clyde H. Maize, state mine inspector, 20th Bituminous District, Pennsylvania Department of Mines, for gaining the cooperation of the operators, officials and miners in having no fatalities for more than 20 mo (April 13, 1949 to Dec. 31, 1950) in the production of 5,178,017 tons of coal. This district has 220 underground mines, of which 144 employ less than 5 men.

George Bibby, assistant mine foreman, Banning mines, Republic Steel Corp., Belle Vernon, Pa., for supervising an underground crew of 25 men without a lost-time injury from Jan. 20, 1946 to Jan. 1, 1951, a total of 267,477 man-hours.

R. G. Blackwell, section foreman, Mulga mine Woodward Iron Co.,

Mulga, Ala., for supervising a section crew without a lost-time accident from Sept. 29, 1944 to Jan. 1, 1951, a total of 300,779 man-hours.

Clarence D. Campbell, assistant mine foreman, U. S. Steel Co., Lynch, Ky., for supervising an underground crew of 40 employees without a lost-time accident from Sept. 16, 1946, to Feb. 22, 1951, a total of 288,000 man-hours.

Paul Carter, superintendent of maintenance, Armco Steel Corp., Montcoal, W. Va., for supervising the maintenance crews (inside and outside) of all mines without anyone suffering a lost-time injury from May 10, 1948 to Jan. 31, 1951, a total of 335,400 man-hours with an average of 49 employees.

Oliver Cope, outside foreman Banning mine, Republic Steel Corp., Belle Vernon, Pa., for supervising an outside crew of 16 men without a lost-time accident from July 1, 1935, to Jan. 1, 1951, a total of 525,637 man-hours.

E. D. Dangerfield, recently retired as superintendent, Mine No. 14, Peabody Coal Co., DuQuoin, Ill., for working in coal mines for 60 yr and for supervising the mining of 6,000,000 tons of coal from June 4, 1946, to Jan. 1, 1951, without a fatal accident.

Chester O. Day, assistant mine foreman, U. S. Steel Co., Lynch, Ky., for supervising without a lost-time accident an underground crew of 40 men from Dec. 12, 1946 to Feb. 22, 1951, a total of 256,000 man-hours.

Earl H. Doorill, assistant foreman, Bethlehem Collieries Corp., (W. Va.) Barrackville, W. Va., for supervising a crew of 20 underground employees in Mine 44 without a fatality for a total of 1,012,886 man-hours while producing 1,252,262 tons of coal.

William Feick, Pittsburgh Coal Co., Finleyville, Pa., for supervising and directing a crew of 18 men in drawing timber and making falls in conveyor mining without a lost-time accident from November, 1942 to Jan. 1, 1951, a total of 236,160 man-hours.

W. B. Hayes, superintendent, Amherst Coal Co., Amherstdale, W. Va., for supervising Amherst 1A, 1B and 1C mines without a fatality from July 10, 1942, to Feb. 28, 1951, and continuing, a total of 5,939,779 man-hours for an average of 537 employees producing 4,602,357 tons of coal.

George McClafferty, tippie foreman, Russellton mine, Republic Steel Corp., Indianola, Pa., for supervising a tippie crew without a lost-time accident from Sept. 1, 1943, to Jan. 1, 1951, a total of 319,210 man-hours.

John Miller, assistant mine foreman, Tennessee Coal, Iron & R.R. Co., Birmingham, Ala., for having no lost-time accidents while supervising an underground crew from May 26, 1948

at the **CARBON FUEL COMPANY**

CARBON, WEST VIRGINIA

**TOOL STEEL**  
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has given **11** years of  
trouble-free  
**service**  
and is still less  
than 50% worn!

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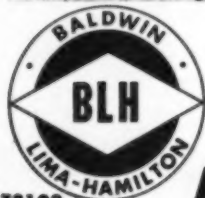
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Made up of standard, factory-built "packaged" components. Eliminate "special" engineering. Complete installations made by simply putting together proper combination of easily assembled frames, supports, take-ups, etc.



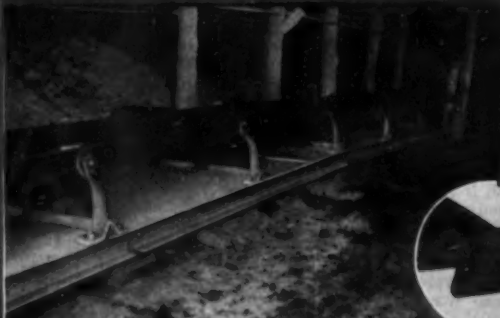
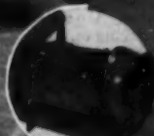
### B-G SLOPE CONVEYORS

Slope conveyors to meet every requirement—without the expense of special engineering, or costly assembly—are available by combining the proper standardized permanent conveyor, factory offset B-G Conveyor "packages." Frames, carriers, drives, take-ups, walkways, headings. A frame and supports are all delivered clearly marked for easy erection. There is maximum flexibility in B-G design which enables you to lengthen, shorten or reassemble your B-G Slope Conveyor at different locations with 100% salvage.



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Made up of self-contained, interchangeable sections, these conveyors are widely preferred for collecting from several panel conveyors, conveying to tipple, railroad cars, standard mine cars, slope conveyor, etc. For each permanent or semi-permanent service, Main Entry Belt Conveyors are built according to heavy-duty mining standards with large carriers, heavy drives, section frames of sturdy structural channel steel with welded steel supports. Standardized sectional construction simplifies transport of the unit to the location, speeds up installation. Note in photo at left how decking plates are bolted to the frame to fully protect the return belt.



### B-G PANEL BELT CONVEYORS

Standardized design allows the selection of panel frame units suited to head room, lump size and other pertinent conditions. For fast retreat operations or in fast moving panel work, B-G Panel Frame units are easy to install, knock down or reassemble. Couplings are designed for maximum rigidity; sections are easily aligned, built to withstand heavy impact, adaptable to longest head room operations.



Write for complete information about the Barber-Greene line of coal handling conveyors—including special conveyors for large haulage, truck loading and stockpiling.



**Barber-Greene Company**

AURORA, ILLINOIS, U. S. A.

to Dec. 31, 1950, a total of 270,461 man-hours.

Ralph O'Brien, cleaning-plant foreman, Banning mine, Republic Steel Corp., Smithton, Pa., for supervising 66 employees without a lost-time accident from Feb. 11, 1947, to Jan. 1, 1951, a total of 445,068 man-hours.

William Parisi, foreman Pittsburgh Coal Co., Library, Pa., for having no fatality since starting as foreman Aug. 1, 1946 to Jan. 1, 1951, and continuing, a total of 3,533,100 man-hours, with an average of 570 men producing 2,431,664 tons of coal.

Luther Poore, assistant mine foreman, U. S. Steel Co., Lynch, Ky., for having had no lost-time accident to the men under his supervision, from Oct. 16, 1944, to Feb. 22, 1951, a total of 288,000 man-hours for an average of 30 employees.

Jesse Shotton, assistant mine foreman, U. S. Steel Co., Lynch, Ky., for supervising a crew of 45 underground employees from Jan. 30, 1947, to Jan. 24, 1951, a total of 288,000 man-hours without a lost-time accident.

Ted Simpkins, assistant mine foreman, Republic mines, Republic Steel Corp., Pikeville, Ky., for supervising an underground crew of 28 without a lost-time accident, from March 19, 1944, to Jan. 1, 1951, a total of 297,745 man-hours.

Harria Slusher, assistant mine foreman, U. S. Steel Co., Lynch, Ky., for supervising an underground crew of 45 from Sept. 29, 1946, to Feb. 22, 1951, a total of 288,000 man-hours without a lost-time accident.

Joe White, assistant mine foreman, U. S. Steel Co., Lynch, Ky., for having supervised an underground crew for 14 yr, March 27, 1937, to Feb. 22, 1951, a total of 448,000 man-hours without a lost-time accident.

Certificates of Honor for notable achievements in safety also were awarded the following coal mines and mining companies:

Alabama By-Products Corp.: Barney, Bradford, Labuco and Samoset mines.

Alabama Power Co.: Gorgas mine. Allegheny Pittsburgh Coal Co.: Springdale mine.

Amherst Coal Co.: Amherst 1A, Amherst 1B, Amherst 1C mines. Bethlehem Collieries Corp.: Mines Nos. 44, 53, 21 and 41.

Bethlehem Fairmont Coal Co.: Scott mine No. 2.

Blue Diamond Coal Co.: Blue Diamond No. 3 mine.

Armco Steel Corp.: Henshaw mine and tippie crew, Stickney mine. Citizen's Coal Co.: East mine.

Colorado Fuel & Iron Corp.: Crested Butte, Frederick, Morley and Rockvale No. 3 mines.

Consolidation Coal Co. (W. Va.): Nos. 25, 35, 63, 97 and Williams mines. W. G. Duncan Coal Co.: Cypress No. 2 mine.

Duquesne Light Co.: Harwick mine. Eastern Gas & Fuel Associates: Federal No. 1, Kopperston No. 3,

## COMING MEETINGS

MINING SOCIETY OF NOVA SCOTIA: 64th annual meeting, July 12-14, Isle Royal Hotel, Sydney, N. S.

GREENBRIER COAL OPERATORS' ASSOCIATION: July 19, Rainelle, W. Va.

OPEN PIT MINING ASSOCIATION. ELECTRICAL DIV.: annual meeting, July 27, Union Bldg., University of Illinois, Urbana, Ill.

1951 COAL BRIQUETTING CONFERENCE: Aug. 2-3, Superior, Wis., sponsored by the Natural Resources Research Institute, Laramie, Wyo.

CENTRAL PENNSYLVANIA COAL PRODUCERS' ASSOCIATION AND EASTERN BITUMINOUS COAL ASSOCIATION: annual meeting, Sept. 13-14, Bedford Springs Hotel, Bedford, Pa.

Powellton No. 6 and Statesbury No. 11 mines.

Geneva Steel Co.: Columbia mine. Imperial Coal Co.

Island Creek Coal Co.: Mines Nos. 1, 7, 24, 25 and 27.

Jamison Coal & Coke Co.: Mine No. 20.

Logan County Coal Corp.: Lundale mine.

Marianna Smokeless Coal Co.: No. 1 mine.

Midwest-Radiant Corp.: No. 1 mine. Old King Mining Co.: Hardbury mine.

Pennsylvania Coal Co.: Ewen colliery.

Perry Coal Co.: St. Ellen mine. Pittsburgh Coal Co.: Crescent,

Mathies, Mongah, Montour No. 4, Montour No. 10 and Renton No. 6.

Pond Creek Colliery: Thacker mine. Pond Creek Pocahontas Co.: Mines

Nos. 1 and 4.

Red Jacket Coal Corp.: No. 5 mine; and company supervising officials.

Reitz Coal Co.: Reitz No. 3 Upper, 3B, 4 and 5 mines.

Republic Steel Corp.: Clyde, Crescent No. 2 and Indianola mine.

St. Louis, Rocky Mountain & Pacific Co.: Koehler mine.

Stonega Coal & Coke Co.: Glenbrook Colliery and Roda No. 5 mine.

Superior Coal Co.: Mines Nos. 1, 3 and 4.

Tennessee Coal, Iron and R.R. Co.: coal washing department; No. 1 Concord, Dacons, Edgewater, Hamilton and Short Creek mines.

The Union Pacific Coal Co.: Reliance No. 7, Rock Springs No. 8, Stansbury 7½ and Winton No. 7½ mines.

West Virginia Coal & Coke Corp.: Omar Nos. 4, 5 and 15 and Norton No. 2 mines.

The following individuals received

Certificates of Honor for unusual rec-

ords of working in and around coal mines, without suffering a lost-time accident during those periods, as noted:

John Cameron Baldwin, Bluefield, W. Va., 56 yr; John Bennet, Ward, W. Va., 40 yr; John Berry, Summerlee, W. Va., 53 yr; John Billey, Sabraton, W. Va., 46 yr; Borse W. Blofeld, Clearco, W. Va., 47 yr; Harry Buller, Breese, Ill., 47 yr; A. E. Castro, Ward, W. Va., 48 yr; James Cerutti, Cadogan, Pa., 46 yr; Herbert Cook, Central City, Pa., 66 yr; Charles Albert Coster, Omar, W. Va., 52 yr; Samuel L. Craig, Tarra, Pa., 42 yr.

James Cutler, Scalp Level, Pa., 41 yr; Clement Dalton, Maestown, W. Va., 40 yr; Charles Thomas Davis, Pocahontas, Va., 62 yr; Andrew Dawson, Pocahontas, Va., 55 yr; John Dillard, Maitland, W. Va., 53 yr; Robert Fuller, Ward, W. Va., 43 yr; John O. Gill, Barnes & Tucker Co., Barnesboro, Pa., 50 yr in Barnes & Tucker mines; Samuel B. Gullion, Bluefield, W. Va., 58 yr; Thomas K. Hess, Newhall, W. Va., 52 yr; M. T. Higdon, Blue Diamond, Ky., 46 yr.

Nicholas Frank Hoffman, Mahanoy City, Pa., 70 yr as general repairman, machinist and master mechanic for the Philadelphia & Reading Coal & Iron Co.; Bolen Hooks, DuQuoin, Ill., 47 yr in No. 14 mine, Peabody Coal Co.; John Jacobs, Elm Grove, W. Va., 46 yr; Steven Jancsura, Hastings, Pa., 47 yr; Arthur Leonard Justice, Coal City, W. Va., 55 yr; Thomas Lowe, Montcalm, W. Va., 53 yr; William Paul McDaniel, Birmingham, Ala., 45 yr in and around the coal mines of the Tennessee Coal, Iron & R.R. Co.; Joseph Madison, Landgraff, W. Va., 49 yr; James Muir, Livingston, Ill., 41 yr; Andrew Clold Nelson, Boiesvain, Va., 65 yr; William Norris, Carretta, W. Va., 63 yr; Anton Petrovich, Four States, W. Va., 40 yr.

William Ray, Bethlehem Collieries Corp., Johnstown, Pa., 56 yr (still employed); Alex Reed, Melcroft, Pa., 50 yr; John Theodore Reilmann, Breese, Ill., 56 yr; Emmett Orville Ring, Iashmeet, W. Va., 41 yr; John D. Rockwood, Rock, W. Va., 51 yr; Harry Roush, Bethlehem Collieries Corp., Ebensburg, Pa., 52 yr (still employed); Shirden Rutherford, Warriormine, W. Va., 55 yr; George L. Smith, War, W. Va., 52 yr; James G. Smith, Excelsior, W. Va., 52 yr; John Sosenberg, Sawyerville, Ill., 54 yr; Oliver Sutch, Rains, Utah, 58 yr; John F. Tillman, Skelton, W. Va., 48 yr.

Thomas Tipples, Gillespie, Ill., 56 yr; Tom Tipton, Vallacreek, W. Va., 53 yr; William Dabney Tyree, Sr., Kimball, W. Va., 51 yr; John Henry Valentine, Winding Gulf, W. Va., 50 yr; Bussie Verno, West Alexandria, Pa., 47 yr; Thomas Walker, Indian Head, Pa., 53 yr; George Ward, Hugheston, W. Va., 42 yr; James Archer Wilson, East Beckley, W. Va., 58 yr; John Ezra Wysong, Montcalm, W. Va., 52 yr; Michael Zdelar, Bethlehem Collieries Corp., Johnstown, Pa., 48 yr (still employed).

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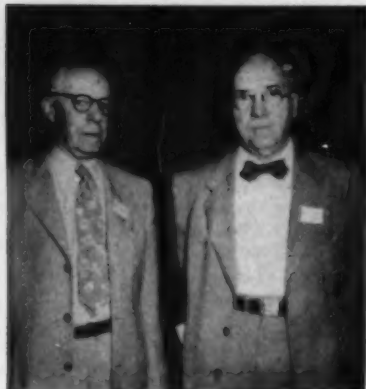


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Seattle 4



**NEW OFFICERS**—President, H. B. Crandell (left), Clayton Coal Co.; secretary-treasurer, Fred W. Whiteside, consulting engineer. **RIGHT PHOTO: MINING AND ARRANGEMENTS**—John H. Emrick (left), Joy Mfg. Co.; D. H. Pape; Joseph F. Joy; Prof. Albert N. Keenan, Colorado School of Mines, chairman, program committee; and Walter F. Clarke, Independent Coal & Coke Co., general chairman.

## Modern Mining Rocky Mountain Theme

**Mechanized Mining, Belt Hoisting, Face Preparation, Illumination, Roof Bolting, Coal in the Defense Effort, Engineering Training, Gasification and Safety Feature 47th Meeting of the Rocky Mountain Coal Mining Institute**

**WITH EFFICIENT MINING** as the major theme, members of the Rocky Mountain Coal Mining Institute also discussed labor and government relations, illumination and safety at the organization's 47th meeting, held at the Hotel Utah, Salt Lake City, Utah, June 7-9. General chairman of the

meeting was Walter F. Clarke, Independent Coal & Coke Co., Salt Lake. Chairman of the program committee was Prof. Albert N. Keenan, head, coal-mining section, Colorado School of Mines, Golden, Colo.

At the business session, the following were chosen as officers for the

institute during the coming year:

**President**—H. B. Crandell, president, Clayton Coal Co., Denver, Colo., succeeding A. B. Foulger, president, Lion Coal Corp., Ogden, Utah.

**Vice President, Colorado**—Clement Audin Sr., Champion Coal Mining Co.  
**Vice President, New Mexico**—An-



**CONTINUOUS LOADING WITH BRIDGE CONVEYORS**—A. B. Crichton Jr. (right), vice president, Johnstown Coal & Coke Co., with A. P. Coderlot, Peerless Coal, Inc., session chairman.



**GASIFICATION, LIGHTING AND MINING**—Paul L. Shields, Spring Canyon Coal Co., presiding; R. B. Moore, Union Supply Co.; Dean Jenks, General Electric Co.; James L. Elder, United States Bureau of Mines; and J. Q. Berta, Union Pacific Coal Co.



**MINING AND HOISTING**—William K. Dennison Jr. (left), St. Louis, Rocky Mountain & Pacific Co.; A. B. Foulger, president, Lion Coal Corp., and retiring president; J. Walter Snavely, Chain Belt Co.



**DSFA AND FACE PREPARATION**—Walter J. Johnson (left), Sheridan-Wyoming Coal Co.; Charles W. Connor, DSF Administrator; George Bywater, U. S. Geological Survey (presiding).

draw Gracie, St. Louis, Rocky Mountain & Pacific Co.

**Vice President, Utah**—John Peperakis, Kaiser Co., Inc.

**Vice President, Wyoming**—Arthur K. Perry, Sheridan-Wyoming Coal Co., Inc.

**Vice President, Montana**—S. H. Clarke, Sheridan-Wyoming Coal Co., Inc.

**Secretary - Treasurer**—Fred W. Whiteside, consulting engineer, Denver (re-elected).

**Executive Board**—Colorado, Prof. Albert N. Keenan, Colorado School of Mines, and James Brennan, Imperial Coal Co.; Utah, B. H. Ludwig, Hercules Powder Co., and Thomas C. Jackson, United States Fuel Co.; New Mexico, John A. Garcia, chief mine inspector, and Oscar Huber, Albu-

querque & Cerrillos Coal Co.; Wyoming, A. M. Strannigan, Union Pacific Coal Co., and Lyman Fearn, chief mine inspector; Montana, G. E. Gildroy, Bair-Collins Co., and James R. Brophy, Brophy Coal Co.

George B. Pryde, formerly president of the Union Pacific Coal Co., was elected a life member, and the Institute went on record in favor of positive steps to acquaint the Munitions Board and other government groups with the availability of western coal and the willingness of the western industry to serve in the defense effort.

Opening the technical sessions, Mr. Foulger discussed briefly the industry situation, with particular reference to the status of commercial operations. Mechanical mining, he emphasized, is the industry's main

weapon, and has benefited both the operators and miners. However, the industry must stay awake to survive, and a major problem is relations with the Union.

The miners, Mr. Foulger declared, are entitled to improved conditions and the contract has been a major stabilizing influence. Nevertheless, there has been too much appeasement and union leaders have exploited both miners and operators. Consequently, the industry has reached the danger point and a better means of stabilization is necessary. Noting that steel apparently is willing to go quite far to avoid strikes, Mr. Foulger pointed out that commercial operators have quite a different problem as a result of severe competition. Costs have, or are, becoming prohibitive, though there still is no choice but to sign contracts as presented. Further increases in costs are even more dangerous. Therefore, every operator must look ahead, make his influence felt, and try to get the contract revised in the interest of sane and profitable mining.

A major factor in the present union relations situation, observed D. H. Pape in discussion, is the concentration of control as a result of loss of local union autonomy. That situation must be rectified before a return to a sound basis is possible.

Introduced by Mr. Foulger as the father of mechanical coal mining in the United States, J. F. Joy declared his belief that coal's problems are greater today than ever before, though the industry has proved its ability to surmount past problems and will do so again. Great improvements in equipment for continuous mining were forecast by Mr. Joy. For example, machines able to advance a foot a minute in development are

(Continued on p 150)



**SAFETY PANEL**—Finlay McCollum (left), Colorado district inspector; John A. Garcia, chief inspector, New Mexico; Tom O'Neal, USBM; E. O. Jackson, Independent Coal & Coke Co.; L. L. Arnett, Utah district inspector; H. O. Lindeman, Geological Survey; R. H. Dalrymple; and Lyman Fearn, chief inspector, Wyoming, chairman.

## Personal Notes

William M. Ritter, general manager, Red Jacket Coal Corp., Red Jacket, W. Va., has been elected a vice president of the company, in addition to his post as general manager.

Ted L. Keles, vice president, Sinclair Coal Co., has moved to Chicago as executive vice president of the Southern Coal Co. He previously was general superintendent of Sinclair's western division, which includes mines in Missouri, Iowa and Oklahoma.

Raymond E. Salvati, president of the Island Creek Coal Co. and the Pond Creek Pocahontas Co., has been named president of the Island Creek Coal Sales Co., succeeding H. A. Glover, whose retirement was announced last month. Mr. Glover, who will make his home in Asheville, N.C., will continue to serve the company as a consultant.

Several changes in operating personnel of the Coal Div., U. S. Steel Co., recently were announced, effective June 1. August R. Werft was named chief engineer, and Charles W. Connor, Jr., assistant general superintendent of the Uniontown, Pa., district. James P. Flynn was appointed superintendent of the Palmer mine, and William Wheeler was made superintendent of Leidenring mines.

M. H. Hall, chief engineer, Olga Coal Co., Coalwood, W. Va., has been named superintendent of construction for the company. H. E. Mauck, general superintendent, has announced. D. C. Ridenour, mining engineer, has been promoted to chief engineer to succeed Mr. Hall. Mr. Ridenour, who has been active in the installation and operation of an extensive mechanization program at the No. 2 Caretta mine, previously was division engineer for the Pittsburgh Coal Co. before joining Olga Coal in May, 1949. In his new post, Mr. Hall will supervise sinking of a 820-ft-deep 22-ft-diameter concrete-lined shaft. With use of an air-controlled clam bucket system of loading rock into the hoisting buckets developed by Mr. Hall, little or no hand-mucking will be required, Mr. Mauck reports. Mr. Hall also will be in charge of the churn-drilling of two 48-in-diameter ventilation holes approximately 700 ft deep, which are expected to be the deepest holes of their size yet drilled.

William Stapleton, superintendent, Mine No. 204, Consolidation Coal Co. (Ky.), Div. of Pittsburgh Consolidation Coal Co., Jenkins, Ky., has been transferred to the company's Hendrix mine, succeeding Kenneth Hughes. Mr. Hughes is reported to be planning operation of a truck mine.

Felix Minor has been transferred from the Imboden (Va.) mine of the Stonegate Coke & Coal Co., where he



## U. S. Steel Promotes Knapp

R. HERBERT KNAPP has been named chief mining engineer of the Coal Div., U. S. Steel Co. It was announced May 31. Mr. Knapp joined the company in 1943 as assistant mining engineer for the H. C. Frick Coke Co. at Uniontown, Pa. He was appointed mining engineer in 1945 and was promoted to chief engineer 2 yr later. He had been chief engineer of U. S. Steel's Frick coal division since last January. After attending Georgia Tech and Columbia University, Mr. Knapp began his engineering career in 1931 with the Philadelphia & Reading Coal & Iron Co. He also was associated with the Clover Split Coal Co. and the Clover Derby Coal Co. and with the Cerro de Pasco Copper Corp. in Peru.

has been for 42 yr, to the company's Stonegate mine as superintendent. Harry W. Meador Jr. has been named superintendent at the Imboden mine. Following army service, Mr. Meador completed his college training and since graduation from Lehigh University in 1949 has been with the engineering and safety departments of the company.

Several operating appointments in the Coal Div., Eastern Gas & Fuel Associates, recently were reported. E. W. Potter, superintendent, Powellton No. 6 mine, has been transferred to the Beards Fork mine in the same capacity. Wayne M. Plymale Jr., for the past 2½ yr general inspector in the accident-prevention department, has been named superintendent at Powellton No. 6. R. B. Pickett, section foreman, has been promoted to assistant general mine foreman, Kenston mine, succeeding A. H. Steele, whose appointment as general mine foreman was reported last month. At Powellton No. 3 mine, Leonard Tucker has been promoted from fireboss to general mine foreman on the third shift.

Thomas G. Ferguson has been elected vice president of the Pittsburgh

Coal Co. Div. of Pittsburgh Consolidation Coal Co., H. C. Rose, division president, announced June 19. A graduate in mining engineering of Carnegie Institute of Technology, Mr. Ferguson joined Pittsburgh Coal in 1934 as an underground supervisor. He was successively promoted to assistant and then mine superintendent and has served as a division superintendent since 1945.

E. A. Watters Jr., formerly general superintendent of mines for the Hicks Coal organization, has joined the staff of the George S. Baton Co., Pittsburgh, as mining engineer. Mr. Watters, has received his master's degree in mining engineering from Columbia University.

Cadwallader Evans Jr., Scranton, Pa., former president of The Hudson Coal Co., was one of six alumni of Lehigh University to receive distinguished service awards from the alumni association at its annual reunion held last month. The awards honor individuals "who through the years have distinguished themselves both through personal achievement and service as to bring lasting recognition and credit to themselves and to Lehigh University."

Harold D. Parnell, chief mining engineer for the Clinchfield Coal Corp., Dante, Va., since 1948, has been named an industrial specialist in the industry finance division of the DSFA, where he will analyze applications for defense loans from coal and coke operators. Before joining Clinchfield, Mr. Parnell had served as an engineer with the Armo Steel Corp., Montcoal, W. Va.

James H. Pierce, president, Pierce Management, Inc., Scranton, recently was one of six alumni of Girard College to be honored with the Alumni Award of Merit. Presentation was made at an Alumni Association dinner held at the Scranton Club.

James R. O'Neal, Oceana, W. Va., has been appointed an instructor in the Department of Mining Extension of West Virginia University, with headquarters in Logan.

## Obituaries

Edward L. Clair, 57, president of the Olga Coal Co., died June 13 at his home in Cleveland after a long illness. A nationally known coal and steel executive, Mr. Clair also was president of the Interlake Iron Corp., first vice president of the Palmer Mining Co. and Dalton Ore Co. and active in various other firms. He also was a director of the Bituminous Coal Operators' Association.

William Burnett, 59, electrical engineer, Peabody Coal Co., Chicago, died June 14.

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## 2. Performance Inspection:

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## 3. Owner's Service Policy:

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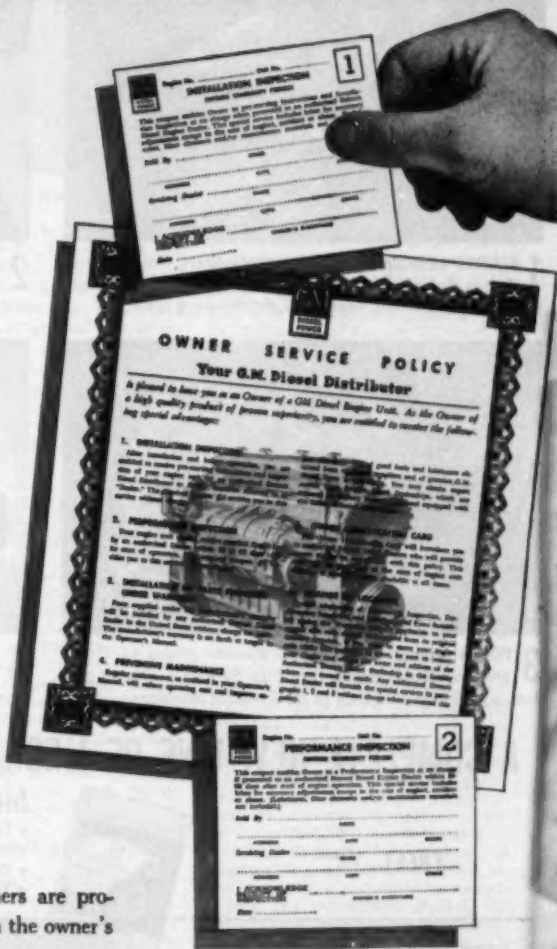


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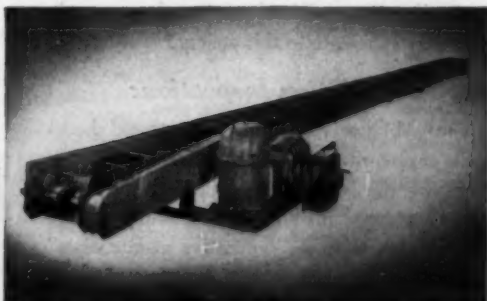
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### Top Men in EG&FA Safety Competition

WINNERS OF AN EXPENSE-PAID TRIP to the Mine Inspectors' Institute meeting in Lexington, Ky., June 4-6, were these five supervisors in the Coal Div. Eastern Gas & Fuel Associates: Everett G. Dillard (left), L. M. Douglas, M. H. Dinsmore, Paul Chikos and Delmar L. Hunter. They were top-ranking contestants in a division-wide safety contest in which 365 men, or 72.5% of those eligible, participated. Divided into seven parts over a 14-wk period, the contest required answering of 119 questions designed to broaden the supervisors' knowledge of company procedures and practices, the writing of a composition and the ventilating of a mine map. The 365 men spent a total of 3,003 hr of their own time in participating in the contest, the EG&FA accident-prevention department estimates.

## Defense Developments

### Deadline Delayed

The Coal Mines Serialization Order SFO-1 has been amended to permit filing of data up to June 30, 1951. The original order required coal and coke operators to submit information May 15. SFO-1 is discussed on p 73 of this issue of *Coal Age*.

### Try Others—Then DSFA

Solid-fuels producers in need of critical materials such as steel and copper should exhaust all available sources before appealing to DSFA for help, according to C. W. Connor, administrator. After that, DSFA will make every effort to help, he said.

### OP5 Names Industry Advisory Committees

The Office of Price Stabilization has announced the membership of two recently formed committees, as follows:

**Bituminous Coal Producers' Industry Advisory Committee**—R. R. Bowie, Bowie Coal Co.; W. H. Cooke, Little Sister Coal Corp.; E. H. Davis, New York Coal Co.; B. R. Gebhart, Chicago, Wilmington & Franklin Coal Co.; C. R. Griffith, Southern Coal & Coke Co.; R. E. Jamison Jr., Jamison Coal & Coke Co.; L. R. Kelce, Sinclair Coal Co.; R. H. Knode, Stonega Coke & Coal Co.; R. H. Moore, C. A.

Hughes & Co.; C. J. Potter, Rochester & Pittsburgh Coal Co.; H. C. Morrison, West Virginia Coal & Coke Corp.; Walter Rothenhoefer, Coal Division, Eastern Gas & Fuel Associates; P. L. Shields, Spring Canyon Coal Co.; and R. E. Snoberger, Truax-Truax Coal Co.

**Lake Coal Dock Industry Advisory Committee**—R. P. Botsch, United Coal & Dock Co.; Worrell Clarkson Jr., Clarkson Coal Co.; Henrique Crawford, Berwind Fuel Co.; H. P. Junod, Pickands Mather & Co.; A. T. Kuesel, Arthur Kuesel Coal Co.; J. H. Lawrence, Coal Department, Cleveland-Cliffs Iron Co.; O. S. McFarland, Wisconsin Great Lakes Coal & Dock Co.; W. H. Pugh, W. H. Pugh Coal Co.; W. A. Reiss Jr., The C. Reiss Coal Co.; and Richard Relf, North Western-Hanna Fuel Co.

### Fuel Stockpiling Urged

DSFA has pledged strong support of Secretary of the Interior Chapman's plea that solid fuels be stocked this summer. Defense Transport Administrator Knudson also has joined in the plea, pointing out that defense-industry traffic this fall and winter will be heavy and that there already is a shortage of railroad coal cars. Mr. Knudson said that transportation must be provided for 10% more coal than was hauled in 1950. The shortage will be even more acute in oil and LPG-tank cars, he added.

DSFA Administrator Connor reported that his agency is working with defense and industry agencies

and state and local governments to set up procedures for averting local shortages next winter. He urged coal producers and distributors to press the summer buying program. He predicted demand for about 580,000,000 tons of bituminous and lignite in 1951.

### Guard Coal Manpower

Secretary of the Interior Chapman has appointed Charles R. Ferguson, assistant safety director, UMWA, as deputy administrator of DSFA to promote labor-management relations and "work within the industry on national manpower mobilization policy and the maintenance of an industry work force adequate to meet solid-fuels requirements of the defense program."

### DSFA Deputy Named

The appointment of William F. Hahman as deputy administrator of the DSFA was announced June 18. Mr. Hahman, who was formerly director of the Solids Fuels Div. of the NSRB, previously was special assistant to the president of the Rochester & Pittsburgh Coal Co. and also was associated with the Dexter-Carpenter Coal Co., Juliette Coal Co. and Denise Coal Co. in executive capacities.

### DSFA Authorized to Act On Construction Applications

As part of a delegation of power to eight government agencies designed to decentralize and speed operation, the National Production Authority June 7 authorized the DSFA to act on applications from producers and processors of solid fuels to begin construction of projects as provided under the NPA Order M-4. The applications should be filed directly with the DSFA in Washington, which is preparing a special form for that purpose. In the meantime, Form NPA F-24 obtainable from Department of Commerce field offices should be used. DSFA is empowered to act on applications for adjustment or exceptions based on claims of undue hardship or on claims that the construction furthers the defense effort or is essential to maintain the public health, safety or welfare. It cannot authorize construction prohibited under Order M-4. While construction of solid-fuels facilities for which a tax amortization certificate has been issued or a defense loan made is exempted from the restrictions of M-4, the authorization applications still must be filed with the DSFA.

## Association Activities

Coal Producers' Association of Washington, Seattle, at its annual meeting last month, elected the following to the board of trustees for the coming year: Earl R. McMillan, Northwest Improvement Co., retiring president of the association; Harry Patrick,

Roalyn-Cascade Coal Co.; Jack Morris, Palmer Coking Coal Co.; Fred Bianco, Bianco Coal Mines; and William Strain, Strain Coal Co.

The Locomotive Development Committee, Bituminous Coal Research, Inc., announced May 15 that it had moved its research office from Baltimore, Md., to 320 S. Roberts Rd. Dunkirk, N. Y. Extensive operating tests of the coal-fired gas-turbine locomotive under development by the LDC are being carried on at the Dunkirk plant of the American Locomotive Co.

Edward Griffith, president, Glen Alden Coal Co., has been elected chairman of the Anthracite Opera-

tors' Wage Committee, succeeding the late Ralph E. Taggart. Edward G. Fox, president, Philadelphia & Reading Coal & Iron Co., has been elected a member of the committee.

Michael J. Kosik, president of District 1, UMWA, last month was named secretary of the Anthracite Conciliation Board, succeeding the late John Boyland. Mr. Kosik started work in the mines at the age of 13 and had held various posts in the local up to the time he was made district vice president in 1925. He has served as district president since 1935. He took over his new post immediately, continuing as head of the union until selection of a successor is made.

## New Mine Developments

The Sheffield Steel Corp., Kansas City and Houston, has contracted with Allen & Garcia Co., Chicago, for construction of a new coal mine at McAlester, Okla., in the McAlester seam. The operation will have a capacity of 2,000 tpd and will supply coal for new blast furnaces in Houston, Tex.

With completion of its new 350-tph preparation plant near Zap, N. D., the Dakota Collieries Co., Minneapolis, will have one of the most modern mines in the Northwest, practically completing a 10-yr modernization program involving an expenditure of some \$750,000, it reports. The new plant, being built by McNally Pittsburgh, is expected to begin operation about Aug. 15, reaching full capacity before the fall heating season begins. Costing approximately \$300,000, the tipple is completely new and incorporates the latest type of coal-handling equipment. Features include screening of all sizes of coal, oil treatment of the smaller sizes and boom-loading of open-top cars.

The Victory mine of the Pyramid Coal Corp., near Terre Haute, Ind., reportedly is being re-opened to mine newly leased coal reserves nearby that are expected to extend the life of the property by 8 to 10 yr. The mine, which was closed down this spring as worked-out, formerly was producing approximately 3,000 tpd.

The Grapevine Coal Co., Madisonville, Ky., was acquired June 4 by the Black Star Coal Corp., Louisville. The property was sold for \$170,000 under a court order to satisfy a judgement of \$189,495.50 in favor of Black Star, which was the only bidder. Operation of the mine will be continued, with greater output planned, Albert B. Hill, Black Star president, said.

The Chicago & Eastern Illinois R.R. announced June 12 that the McNally Pittsburgh Mfg. Co. had been awarded a contract to install a \$250,000 rail-

to-barge conveyor on the Ohio River at Jopka, Ill., to serve the new utility plant being built to supply the new atomic-energy plant west of Paducah, Ky. A 42-in conveyor belt will move coal from hoppers under the railroad's tracks to river barges 360 ft away at the maximum rate of 600 tph.

The newly established United States Coal Co., Cleveland, opened in May its new Midland strip mine at Holloway, Belmont County, Ohio. It is to have a daily capacity of 3,000 tons and will mine the No. 8 seam.

The Paraglove Coal Service Corp., which this spring opened its new Chieftain No. 2 mine near Dola, Harrison County, W. Va., expects to develop the property from its present output of 400 tons daily to full capacity of 1,600 tpd by the end of the year. The fully mechanized mine is a drift operation, mining the 78-in-thick Pittsburgh seam and shipping via the B&O. Preparation facilities include crushers, picking table, shaker and vibrating screens.

Among the six truck mines operating on Millstone Creek, near Whitesburg, Ky., which resumed operation May 28 after being closed for several months for lack of orders, were those of the P. & M. Coal Co., the Bentley Coal Co. and the C. & W. Coal Co. The six mines produce about 1,000 tpd, trucking the coal for loading to the No. 207 plant of the Consolidation Coal Co. (Ky.).

Development of new properties in several states has been reported as follows, but with only limited information immediately available:

In Ohio, the East Fairfield Coal Co., Columbiana, opened a new strip on June 1 and plans another this summer to replace a property to be worked out by August. The Columbus Coal & Mining Co., Coshocton, also was scheduled to begin production from a new mine June 1.

At McAlester, Okla., the Lone Star Steel Co., Lone Star, Tex., is planning to develop a new Carbon No. 6 mine, which will be adjacent to its present No. 5 operation.

In Pennsylvania bituminous, Dunlo Coal Co., Inc., Windber, is planning a new deep mine on the D seam in Somerset County. The company also has opened the Golden Lee mine in Webster County, West Virginia, operating in the Sewell seam. The Troy 5-C mine at Berlin, Pa., formerly operated by Dunlo, was opened this spring by the Somerset Coal Corp., Somerset, and is known as the Comstock No. 2 stripping. The Evans Coal Co., Clarion, reportedly plans to start a new operation this fall.

The Vaspar mine of the Vaspar Coal Corp., Vaspar, Tenn., recently was leased by the Block Coal & Coke Corp., Block, Tenn., and is to be rehabilitated for opening about Sept. 1.

In West Virginia, the Coalburgh-Kanawha Mining Co. is developing a new operation in the Cedar Grove seam near Coalburgh. The Martin Coal Co., Fairmont, opened June 1 its new Kern strip mine at Flemington. The property will have a capacity of 1,000 tpd, in the Pittsburgh seam, and ships via the B&O. The Redyard Coal Co., Pineville, is developing a new mine at Oceana, to be known as Mine No. 1.

## Save Scrap Now!

To make steel, mills need a 50-50 mixture of scrap and pig iron.

A low new level of scrap inventories at the steel mills threatens to slow down steel production.

If you want to help the steel industry make more steel for our armed forces, our industries and your own coal mine, here's what you can do:

1. Go after idle scrap on your properties. Start an emergency inspection and inventory of all heavy steel—machines, equipment, beams and plates. Gather up the scrap and sell it to your nearest scrap dealer.

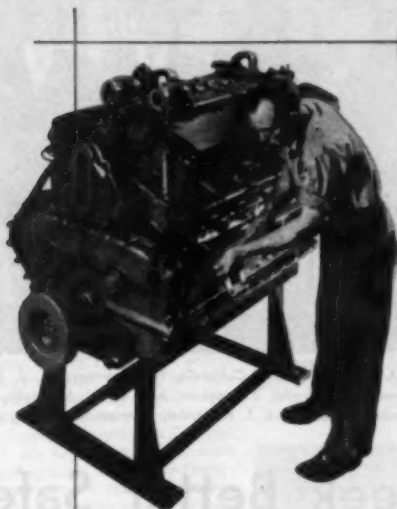
2. Keep the scrap flowing. Keep a continuous inspection going. Organize a clean-up committee to ferret out scrap and collect it.

3. Make top management responsible for organized salvage. The cooperation of your top executives will guarantee a steady flow of scrap back to the mills.

4. Put scrap collection on a housekeeping basis. Continuous recovery of obsolete machines and equipment not only helps the steel industry but the Nation. It also reduces taxes through inventory write-off, improves safety conditions, lowers insurance rates and clears valuable plant, warehouse and working space.

**BUILT NOT ONCE BUT**

**TWICE!**



Cummins is the custom-builder of the Diesel industry. Each engine is built to *fit the job*—and the individual piece of equipment in which it is to be installed. And every Cummins engine is built *twice*. First, each engine is assembled, run-in tested. Then it is disassembled completely, and inspected. Finally it is reassembled and tested *again*. This extra care in precision building, Cummins exclusive fuel system, efficient parts and service organization... mean less "down-time" and more power and profits for Cummins users. See your Cummins dealer.



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**CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA**

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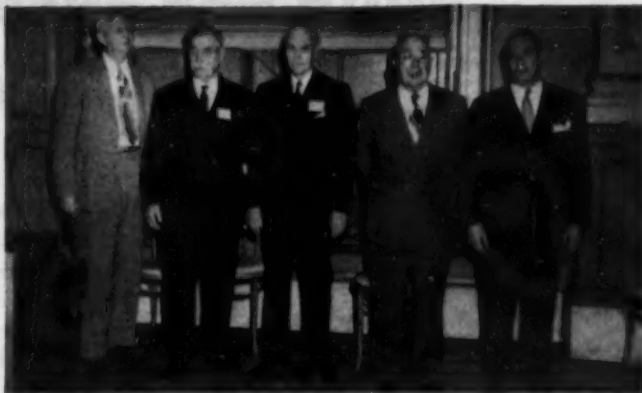
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Diesel Engines (50-550 hp)  
for: on-highway trucks  
off-highway trucks • buses  
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TRADEMARK REG. U. S. PAT. OFF.

**Roof-Bolting, Haulage and Face Support Are Spot-lighted As Inspectors Hold 41st Annual Convention—Institute Endorses Roof-Bolting—Dust Problem Scanned—Arch J. Alexander Elected Institute President for Coming Year**



**NEW OFFICERS**—C. A. McDowell (left), California, Pa., secretary; Dr. J. J. Rutledge, Annapolis, Md., treasurer; A. F. Harper, Birmingham, Ala., and J. M. Malloy, Oklahoma City, Okla., vice presidents; and Arch J. Alexander, Charleston, W. Va., president.

## Mine Inspectors Seek Better Safety

**SAFETY IN MINE HAULAGE**, training of supervisors and workers, roof-bolting and face-support practices were top subjects as 298 members and 11 visitors attended the 41st annual convention of the Mine Inspectors' Institute of America in Lexington, Ky., June 4-6.

Arch J. Alexander, chief, West Virginia Department of Mines, Charleston, W. Va., was elected president for the coming year; John M. Malloy, chief mine inspector, Oklahoma City, Okla., first vice president; George H. Deike, president, Mine Safety Appliances Co., Pittsburgh, Pa., second vice president; and A. Finley Harper, chief, Alabama Division of Safety, Birmingham, third vice president.

Other officers were re-elected as follows: C. A. McDowell, California, Pa., secretary; T. J. Casey, Halifax, Nova Scotia, assistant secretary; Dr. J. J. Rutledge, Annapolis, Md., treasurer; P. J. Friel, Shamokin, Pa., editor-in-chief; J. W. Fitzjarrell, Fort Smith, Ark., assistant editor-in-chief; J. H. Edwards, Huntington, W. Va., publicity editor; and E. A. Farnsworth, Centerville, Iowa, assistant publicity editor.

A resolution endorsing roof-bolting, provided it complies with state and federal laws and regulations, was adopted by vote of the membership at the closing session Wednesday morning.

Belts and conveyors in trackless mining have introduced new and different hazards, said B. H. Mills, mine inspector, Coal Div., U. S. Steel Co., Lynch, Ky. Mr. Mills was the first speaker at the Monday afternoon session, Mr. Malloy presiding.

At the Lynch mines, the coal aver-

ages 36 in in thickness, Mr. Mills explained. Belts and shaking and chain conveyors are used in a room-and-pillar system working panels. Hazards in belt-and-conveyor transportation, together with measures taken to reduce the dangers, are as follows:

1. Transportation of men on underground belts—Side clearance of 5 ft from belt frame to the nearest timber is maintained for a distance of 50 ft where men load and unload. Men must ride at least 6 ft apart. Remote-control switches, marked by lights, are installed at all loading and unloading points and at 300-ft intervals along belt lines. Minimum top clearance of 18 in is provided. Platforms with overhead hand rails are installed at lateral head pieces and belt crossings and men crossing conveyors are required to face in the direction opposite to belt travel. When men are riding the belt, speed is held to 120 fpm. Red lights mark all places where men unload from the belt and careful supervision is provided.

2. Transportation of tools and supplies—Clear understanding is required between two or more men as to where tools are going and who is to take them off. Tools must be loaded at least 10 ft behind the man who is to take them off. Men must grasp the rear end of the tools when unloading them. Materials and supplies are moved in be-

tween shifts. Young men, being more agile, are selected for this work.

3. Coal-dust hazards—To control dust, water is carried to the cutter-bar and, after the coal is shot, water is sprinkled over it. Spilled coal and dust accumulating along pan and belt lines are cleaned up periodically. Haulage-ways and pan- and beltways are rock-dusted so that the dust will contain at least 65% incombustible material. Working faces are rockdusted by hand before shooting.

4. Coal-mine fires—Water taps with valves, 150 ft of hose and 20 bags of rockdust are provided every 300 ft along belt lines, the places being marked by lights. Two fire extinguishers, two gas masks and a telephone are located at all panel belt heads and tail pieces. An automatic device stops the driving motor if the belt stops.

Shuttle-car accidents are caused by three major factors, said Joshua Smith, director of Safety, Coal Div., Eastern Gas & Fuel Associates, Mt. Hope, W. Va. These factors are the human element, the shuttle car itself and the surrounding conditions. The human element is most important, he declared.

To offset the human element in shuttle-car accidents, "buggy" men are chosen principally on the basis of youth, mechanical aptitude, steady nerves, alertness and small to medium size. Operators are carefully trained before being turned loose with a shuttle car and training is continued even after a man passes his apprenticeship. No man is permitted to run a shuttle car without permission or instruction from the foreman. Every operator is thoroughly drilled in company rules and operating procedures, including

### INDUSTRY MEETING

#### —A Special Coal Age Staff-Written Report

controls, lights, steering, brakes, contactors and batteries. First runs are made under close supervision at times when conditions are good and there is no rush. Finally, a new operator is put on slow runs before being put on his own. This training is the responsibility of foremen, who are encouraged to train drivers in advance of need and who are bombarded with literature to stimulate their interest in safety.

Hazards in the shuttle car itself are reduced by using hydraulic reels and providing cable shock absorbers, both of which minimize cable strain; by installing airplane-type brakes; testing cable splices for reversed polarity; and inspecting all shuttle cars every shift.

Hazards in surrounding conditions are reduced by keeping floors in good condition; providing at least 11 ft of lateral room; using roof bolts, which increase lateral room as well as overhead clearance; banning shuttle cars under weak roof that is not cross-timbered; using carrying rails long enough to set two posts under each end at intersections; at battery-charging stations, using a crane operating from rails bolted to the roof; and controlling dust on haulageways.

In discussion following his paper, Mr. Smith explained that on battery-car sections, calcium chloride is used to keep dust down; on cable-reel sections, dust is controlled by repeated cleaning and sprinkling.

Rail transportation also raises safety problems that are complicated by today's need for speed, said W. R. Campbell, district mine inspector, Kentucky Department of Mines & Minerals, Melvin, Ky. Safety factors to be considered in developing a new mine are grades, which should be in favor of loaded trips; drainage, which should cut down the quantity of sand needed; and roadbeds, which besides being solid and firm should provide ample clearance and head room. Rails should be welded or securely fastened and firmly attached to cross-ties or heavy steel ties. Joints should be staggered, track should be aligned, curves should be of long radius and properly banked and switches should be protected by guard rails and provided with switch throws.

Rolling-stock maintenance is an important safety factor, Mr. Campbell said. Wheels, couplings, bearings and door latches should be inspected regularly. Fuses, sand rigging, brakes and lights on locomotives need regular checkups, and re-railers and lifting jacks should be provided. Trip movements should be controlled by a trained dispatcher who is protected from interruptions and distractions. Dependable communications, by telephone or trolleyphone, as well as block systems should be installed. Transportation rules should be stated and broadcast and rules against dangerous practices, such as jumping on and off moving trips, should be enforced.

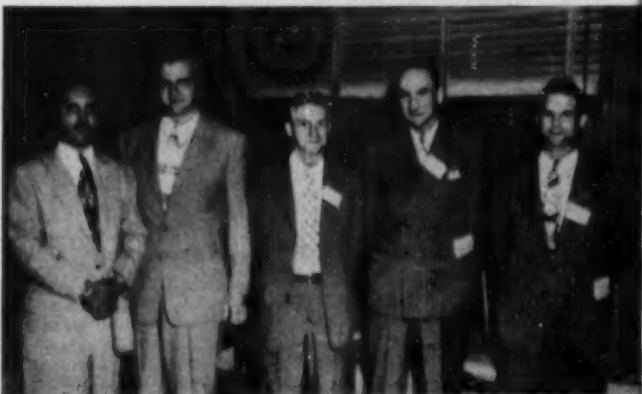
(Continued on page 174)



**MINE-HAULAGE SAFETY**—J. M. Malloy (left), Oklahoma City, Okla., presiding; B. H. Mills, Lynch, Ky.; Joshua Smith, Mt. Hope, W. Va.; W. R. Campbell, Melvin, Ky.; E. C. Olsen, Dragerton, Utah; and J. H. Hansford, Charleston, W. Va.



**ROOF-BOLTING AND DUST CONTROL**—G. H. Deike (left), Pittsburgh, Pa., presiding; Joseph Bierer, Charleston, W. Va.; A. F. Harper, Birmingham, Ala.; W. J. Johnson, Springfield, Ill.; and James Westfield, Pittsburgh, Pa.



**FACE SUPPORT**—H. F. Weaver (left), Washington, D. C.; J. J. Plasky, Red Jacket, W. Va.; Arthur Bradbury, Wheelwright, Ky.; J. V. McKenna, Waynesburg, Pa.; and T. J. Liddle, Big Stone Gap, Va.

# Among the Manufacturers

Two executives of the John A. Roebing's Sons Co., Trenton, N. J., were killed and another injured in the Pennsylvania RR. wreck at Bryn Mawr, Pa., May 18, as they were returning from the Coal Show in Cleveland. Killed were George B. Stoess, assistant sales manager, Wire Rope Div., and Vincent L. Daulton, Philadelphia district sales manager. Mr. Daulton had been associated with Roebing for 23 yr and Mr. Stoess since 1939. Albert Neroni, Roebing advertising manager, who suffered a fractured nose and severe facial lacerations, was hospitalized for 2 wk.

Westinghouse Electric Corp., Pittsburgh, has announced several promotions of sales personnel. Robert E. Ferry has been appointed manager of apparatus sales offices in Wheeling and Fairmont, W. Va., with offices in Wheeling. Mr. Ferry joined Westinghouse in 1928 and previously served in the Fairmont office as sales representative, returning to Westinghouse in 1946 after war service to an assignment in the Wheeling office. In industrial products sales, Thomas R. Lawson has been named assistant sales manager, with offices in Pittsburgh. Mr. Lawson has been succeeded as assistant manager of the application engineering department of the Westinghouse Motor and Control Div., Buffalo, N.Y., by T. C. Finnell, formerly man-

ager of the metallic rectifier section of the Motor Div. Mark F. Slusser, formerly assistant to the sales manager, has been named administrative assistant, industrial products sales.

John P. Howell has been named district manager of the Pittsburgh office of the Jeffrey Mfg. Co. Mr. Howell succeeds J. E. M. Wilson, whose promotion to vice president and manager of the mining division, was reported last month.

Allis-Chalmers Mfg. Co., Milwaukee, has elected Boyd S. Oberlink a vice president. Mr. Oberlink joined the Tractor Div. in 1934 and has served as assistant to the executive vice president in charge of the Tractor Div. since 1946. In the A-C general machinery division, J. F. Roberts has been appointed director of engineering and R. C. Allen consulting engineer. Mr. Roberts formerly was manager of the hydraulic department and Mr. Allen has been manager and chief engineer of the turbo-power development department. Organization of a new mechanical power department in the general machinery division, headed by W. A. Yost, also has been announced. Mr. Yost, who joined A-C in 1943 as manager of the department's marine division, has been manager of its steam-turbine department since 1947.

Glenn E. Rolston, vice president and

director of sales, Rome Cable Corp., has been appointed by Manly Fleischmann, NPA Administrator, as full-time chief of the wire and cable branch in the Metal and Minerals Bureau of the authority's Copper Division in Washington.

Richard S. Walsh has been appointed manager of the Induction Motor Sales Div. of General Electric's Small and Medium Motor Div., Schenectady, N.Y. With the company since 1932, Mr. Walsh was appointed assistant manager of the division in 1948 and became acting manager last January.

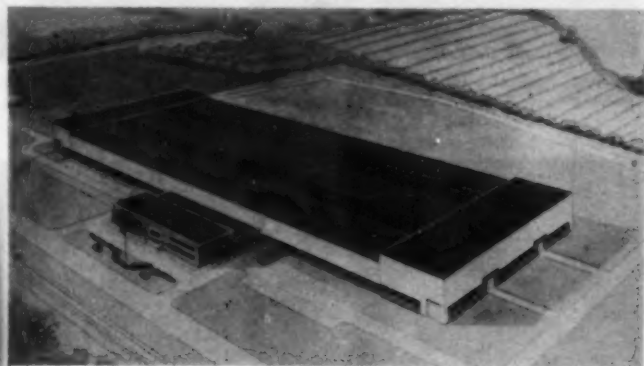
Lester F. Cox, with the company since 1930, has been elected senior vice president of the Thermoid Co., Trenton, N.J., in charge of all Thermoid plants and manufacturing operations. He formerly served as vice president in charge of rubber manufacturing.

Kensington Steel Co., Chicago, has announced several changes in executive personnel. Eugene C. Bauer has been elected chairman of the board and has been succeeded as president by Kenneth Jensen. Eugene C. Bauer Jr., has been elected first vice president. Edmund C. Anderson, sales manager, was elected vice president. Roy W. Sergeant was elected treasurer and assistant secretary. Anthony J. Frystak was elected secretary, and H. M. Albers has been appointed sales manager.

Mining Machine Parts, Inc., Cleveland, Ohio, and the JAB Co., Inc., Ebensburg, Pa., have announced their affiliation in the sale and production of mine equipment. MMP, headed by W. P. Bigler, president, has been made national sales agents for the JABCO line of hook clamp trolley taps, jaw clamps, ground clamps, cable connectors, fuseless taps, Junior trolley taps and plain hooks.

Several members of The General Tire & Rubber Co.'s sales executive staff were promoted in new assignments recently announced that also provided for the creation of a new Northwestern division, including the Portland and Denver branches. Joseph S. Peixotto, Portland branch manager since 1937, assumed direction of the new division, and James W. Haggerty, Northeastern division manager, was promoted to the manufacturers sales department. Earl Schaub, Denver branch manager, has become Boston manager, while David G. Gehring, Boston branch manager, has been promoted to the Akron sales department for special assignments. Mr. Peixotto's Portland post has been filled by Robert G. Magnuson, former assistant Portland manager, and Charles A. Briggs, new account salesman in the Chicago branch, has been promoted to manager of the Denver branch.

William M. Powell, 58, president, Diamond Mfg. Co., Wyoming, Pa., died May 14 following a sudden heart



## Link-Belt Builds New Pennsylvania Plant

CONSTRUCTION of this modern engineering and manufacturing plant for the production of elevating, conveying and processing machinery has been begun by the Link-Belt Co., Chicago, on a 43-acre site at Colmar, Pa., on the Daylestown branch of the Reading Ry. 3½ mi from Lansdale. The new plant will contain approximately 300,000 sq ft of floor space and is so laid out to permit future expansion to double the initial size. It is designed for efficient straight-line manufacture from the receiving department at one end of the 880-ft building to the shipping department at the other end. The new facility is being built to meet the increasing needs of industry, particularly in the East, and also will supplement existing facilities near Philadelphia, where the company has had a plant since 1888. George P. Torrance, Link-Belt president, reported.

# MACK TRUCKS

# See You Through

• There are many good reasons why a Mack is your best truck investment during times like the present. Most important of all is the undisputed fact that Mack trucks outlast them all.

This means that with a Mack truck you can face the uncertainties of the future with assurance...confident that even if trucks should become hard to replace your Mack will see you through...that it will stay on the job delivering dependable service mile after mile and year after year.

Thousands of truck users in World War II found out by actual experience that they were indeed "Lucky to own a Mack." Whatever the future may bring, you'll find that for a sound investment in long-term reliability and operating economy there's no other truck to match a Mack.

Your nearest Mack branch or distributor will give you the full story on what "Built Like A Mack" means in *extra* long life, *extra* strength and stamina, *extra* performance and *extra* dependability.



**...outlast them all**

Mack Trucks, Empire State Building, New York 1, N.Y. Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

In rigorous coal stripping service, big Mack Model LRSW six-wheel trucks have won an outstanding reputation for "seeing things through" with long-lasting, dependable operation.





### State Cites W. Va. Coal & Coke for Safety

Four mines of the West Virginia Coal & Coke Corp., Omar, W. Va., recently received Certificates of Merit from the West Virginia Department of Mines for the production of more than 1,000,000 tons without a fatality as of October, 1950. Three of the mines were continuing their record this spring, with the following output as of Mar. 1, 1951: Norton No. 2 mine, 2,217,145; No. 4 mine, 1,183,233, and No. 5 mine, 1,255,853. No. 15 mine had produced 1,400,000 tons up to Dec. 26.

Shown in the photo above during

presentation ceremonies at a meeting of the local NAF Club are: O. L. Steele (seated, left), superintendent, No. 5 mine; Edward W. Bays, superintendent, No. 15; and F. M. Cook, superintendent, No. 4. Standing are: Pat Heatherman (left), W. Va. district mine inspector; M. D. Collier, general manager; Floyd Varney, mine foreman, No. 5 mine; Rex Lawson, mine foreman, No. 15; T. R. Workman, vice president in charge of operations; and Hurttle M. White, district mine inspector.

attack. He also was president of the National Association of Perforated Metal Manufacturers, secretary-treasurer of the Power Engineering Co., Wilkes-Barre, and president of the Luzerne County Branch of the Pennsylvania Manufacturers' Association.

The General Tire & Rubber Co., has opened a new Tire Service Research Center that is said to be the first of its kind in the nation. Located near General's Akron plant, the new laboratory is dedicated to devising new and improved methods of re-capping and repairing tires for automobiles, trucks and other rubber-tired equipment. It will also serve as an information hub for General's Kraft System, a factory method used only by authorized General dealers, and will be used as a training unit for tire-men from all parts of the country, with General's top engineers and technicians as instructors.

The Dump Car, Trail Car and general car business of the Austin-Western Co., Aurora, Ill., has been transferred for operation by the Baldwin-Lima-Hamilton Corp., Eddy-stone, Pa. Jess Mossgrrove, manager of the car department at Austin-Western, which was acquired by Baldwin-Lima-Hamilton this spring, remains in charge of that department.

A major expansion of engine production capacity, involving new fa-

cilities to cost \$6,000,000, recently announced by Irwin Miller, president, Cummins Engine Co., Inc., Columbus, Ind., is the third major expansion program within the past 9 mos and is expected to increase production capacity at Cummins at least 50% over the 1950 record high level. The new 2-yr expansion program matches the more than \$6,000,000 already expended by Cummins in the 5-yr period following World War II for additional facilities, during which time Cummins production capacity has been increased about 60%.

National Malleable & Steel Castings Co. has begun a \$5,300,000 expansion program designed to raise productive capacity by about 25%, with the larger part of the increase in malleable iron. While all of National Malleable's plants will share in the improvements, the largest expenditures are planned for its Cleveland Works, where an entire new malleable foundry unit will be added.

To meet critical shortages of steel, R. G. LeTourneau, Inc., Peoria, Ill., has started construction of its own steel mill at its plant at Longview, Tex., at an initial investment of nearly \$1,000,000. The mill is expected to be in operation by the end of this year and will be capable of turning out 1,000 tpd of finished steel plate, which will be used at LeTourneau plants in the U. S.

### Preparation Facilities

**John G. Connell Coal Co., Beaver Meadows, Pa.**—Contract closed with Wilmot Engineering Co. for one 5-ft-diameter Hydrotator to prepare Buckwheat No. 1 and rice; feed capacity, 60 tph.

**Clinchfield Coal Corp., Moss mine, Moss, Va.**—Shipment by Deister Concentrator Co. of three Model 108-B Concenco revolving feed distributors.

**Freeman Coal Mining Co., Freeburn mine, Herrin, Ill.**—Installation by Roberts & Schaefer Co. of Hydrotator for cleaning 35 tph of 1½x0-in coal.

**Bluestone Coal Corp., Bluestone, W. Va.**—Contract closed with Roberts & Schaefer Co. for Hydro-Separator coal-washing plant with all auxiliary equipment to clean 3x¾-in coal at approximately 100 tph.

**Peabody Coal Co., No. 10 mine, Pawnee, Ill.**—Contract closed with Roberts & Schaefer Co. for complete coal-preparation plant with a capacity of 1,000 tph of 6x0-in coal; 6x2 to be cleaned in Jeffrey Baum-type jig, minus 2-in being by-passed; five loading tracks for preparing standard Illinois sizes will be provided, together with crushing, dewatering and other standard facilities.

**Colorado Fuel & Iron Corp., Pueblo, Colo.**—Contract closed with Roberts & Schaefer Co. for complete alteration of existing washing plant to increase capacity from 225 to 350 tph of crushed ROM raw coal; two grades of coal to be made for coking ovens and a special foundry coke; Jeffrey Baum jig to be used for cleaning the product.

**V-Day Coal Co., Danville, Ill. (Tem-petone-Matthews Co.)**—Contract closed with Roberts & Schaefer Co. for Super-Airflow coal-cleaning equipment to clean 1½x0, capacity 35 tph.

### New Books for Coal Men

#### Financing a Strip Mine

**Bituminous Coal Strip Mines: Some Financial Considerations**, by A. G. Keller. Here's what a banker thinks about a strip mine as a risk for a commercial loan. By the same token, this book tells strip-mine operators what factors a banker examines before making a loan on strip properties. 150 pp. 6¼x9½-in; boards. No price quoted. Send inquiries to the author, assistant vice president, Mellon National Bank & Trust Co., Pittsburgh, Pa.

#### Guarding Your Engineers

**Utilizing Engineering Manpower.** E.M.C. Bulletin No. 1, issued by the

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**MINES EQUIPMENT**  **Division**

# **JOY MANUFACTURING COMPANY**

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### Pittsburgh Coal Honors "Safety Champions"

NEARLY 400 EMPLOYEES of the Pittsburgh Coal Co., Div. of Pittsburgh Consolidation Coal Co., and their guests attended the 9th annual dinner dance to honor its "Safety Champions" given by the company at the George Washington Hotel, Washington, Pa., in April.

Supervisors become Champions by completing a year without compensable injuries among the men under their supervision. In addition to initial awards of watches on becoming members of the group, men who continue their records are presented with savings bonds by the company at the annual function.

Guest speaker at the dinner was Richard Maize, Secretary of the Pennsylvania Department of Mines. Congratulations were offered by several top officials, including G. A. Shoemaker, H. C. Rose, D. L. McElroy

and J. B. Morrow. The awards were presented by D. H. Davis, T. G. Ferguson and S. K. Hissom, division superintendents.

New members of the group inducted at this year's dinner-dance (above) were—First row: John Kelly (left), Renton No. 3 mine; John Knight, Ocean; Joe Totic, Montour 10; Donald Long, Ocean; William Leake and J. R. McCaughan, Warden; and Alex Piechnik, Westland. Second row: John Kmetz, Warden; John Pryzmatup, Westland; Louis Fefolt and Joseph Hebda, Mathies; William Murphy, Warden; Thomas Silcox, Renton 6; and Harry Mulholland, Renton 3. Third row: Joseph Misaneck, Monagh; Frank Mento, Renton 6; Clyde Frabizio, Warden; Tom Duff, Montour 4; and Pete Hrebinko, Renton 3. Michael Garry, Montour 10, and William Jones, Library shops, do not appear in the photo.

Engineering Manpower Commission of Engineers Joint Council, tells how to request deferments and delays for reservists and draftees. It also discusses briefly the problems of government and industry in selecting and utilizing technical personnel. 25c. Engineering Manpower Commission, 25 West 39th St., New York 18.

### Home-Study Book Updated

Coal Mining, Vol III, 3rd edition by D. C. Jones and J. W. Hunt. If you are a mine supervisor, or a student aspiring to be a mine supervisor, this newest revision is written to serve you as a reference as well as a source of information. Chapter titles are: Expression Aids for Mine Supervisors, Mining Methods, Mining Equipment, Mine Ventilation, Underground Transportation and Mine Electricity. \$35 pp. 6 1/4 x 9 1/4-in.; cloth. \$45.00. Mineral Industries Extension Service, Pennsylvania State College, State College, Pa.

### Other Books and Booklets

Proceedings, Air Pollution and Smoke Prevention Association of

America, Inc., 1950. Twenty-five technical and non-technical papers. 122 pp. 8 1/2 x 11-in.; paper. \$5. John Paul Taylor, Publisher, 520 Pleasant St., St. Joseph, Mich.

Neutralization of Acid Drainage From Bituminous Coal Mines, by S. A. Bralley, G. A. Brady, R. S. Levy and Dorothy Taylor, Mellon Institute of Industrial Research. 14 pp. 6 x 9-in.; paper. Free. Department of Health, Commonwealth of Pennsylvania, Harrisburg.

Subsurface Geology and Coal Resources of the Pennsylvania System in Certain Counties of the Illinois Basin, by G. H. Cady and others. R. I. 148. Includes structure maps of top of No. 6 seam in Clay, Edwards, Gallatin, Hamilton and Richland Counties. 123 pp. \$1; one copy free upon payment of 12c postage by Illinois residents and public libraries. Illinois State Geological Survey, Urbana, Ill.

Illinois Mineral Industry in 1949, by W. H. Voskuil, R. I. 150, 63 pp. 25c; one copy free upon payment of 12c postage by Illinois residents and public libraries. Illinois State Geological Survey, Urbana, Ill.

Coking Coal Deposits of the Western United States, by L. R. Berryhill and Paul Averitt. Circular 90. Free, Chief of Distribution, U.S. Geological Survey, Washington 25, D.C.

The following publications by the Bureau of Mines may be obtained free upon request to Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa. All are 8 x 10 1/4-in.; mimeo; paper.

The Synthesis of Hydrocarbons—Report of the Imperial Fuel Research Institute of Japan, by Shigeru Tautsumi. I.C. 7594. How far the Japanese advanced in oil-from-coal research before and during the last war.

Some Roof-Control Practices in Coal Mines of the United Kingdom, by J. W. Buch and Andrew Allan, Jr. I.C. 7590.

Gas Explosions and Their Prevention, by G. S. Scott, R. E. Kennedy and M. G. Zabetakis, I.C. 7601.

Falls of Roof: The No. 1 Killer in Bituminous-Coal Mines, by J. J. Forbes, T. L. Black and H. F. Weaver. I.C. 7605.

Permissible Mine Equipment Approved During the Calendar Year 1950, by H. B. Brunot. I.C. 7606.

### "Sentinels of Safety" Winners Announced

Awards of "Sentinels of Safety" Trophies for mines working without lost-time injuries and achieving outstanding 1950 safety records in the 26th National Safety Competition conducted by the USBM were announced June 11 by James Boyd, Bureau director. A total of 566 coal and other mines and quarries, working nearly 147 million man-hours, were enrolled in the 1950 competition under six classifications.

Trophy winner among underground bituminous coal mines for the third year in a row was the Reliance No. 7 mine of The Union Pacific Coal Co., Reliance, Wyo., which in 1950 completed its third straight year of operation without a lost-time accident. At the last report, May 21, 1951, the mine's perfect record was continuing, for a total of 1,397,528 man-hours to that date.

Topping the list of underground anthracite mines was the Birdseye mine of The Hudson Coal Co., Throop, Pa., whose employees worked 113,738 man-hours, with four lost-time injuries causing 19 days of disability for a severity rate of 0.167.

The Sentinels of Safety Trophies, donated by the *Explosives Engineer* magazine, are held by the winners for a year, and employees of the winning plants receive an individual Certificate of Accomplishment for their part in achieving the record. Certificates of Achievement in Safety also are awarded to mines making injury-free records and to those which rank from second to fifth place within their

## EQUIPMENT APPROVALS

Six approvals of permissible equipment were issued by the U. S. Bureau of Mines in May, as follows:

Long Super Mine Car, Inc.—Conveyor power unit; one motor, 25 hp, 440 v, AC; Approval 2-786A; May 4.

Joy Mfg. Co.—Type WL82-E Model 30 air compressor; one motor, 30 hp, 250 v, DC; Approval 2-787; May 8.

Goodman Mfg. Co.—Type 860B tractor-tread loader; four 10-hp motors, 250 v, DC; Approval 2-788; May 18.

Goodman Mfg. Co.—Type 93-C-40-608 storage-battery locomotive; five motors, 90 Edison A-16 battery cells; Approval 1543; May 31.

Mine Safety Appliances Co.—Model P standard hand lamp; Approval 1024; May 8.

National Mine Service Co.—10-ton, 100-hp diesel locomotive; Approval 2201; May 8.

respective classification, providing they operate a minimum of 30,000 man-hours. Coal mines awarded Certificates of Achievement in Safety were:

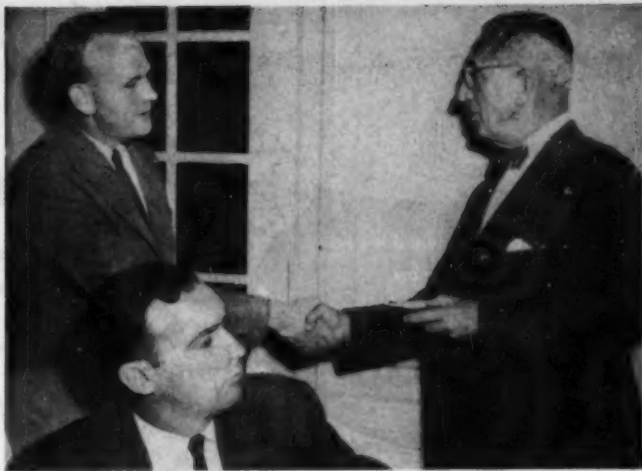
**Anthracite Mines**—North Line mine, North Line Coal Co., Shamokin, Pa.; Pine Grove mine, Penag Coal Co., Pine Grove; Hunter Tunnel mine, Philadelphia & Reading Coal & Iron Co., Ashland; and St. Clair colliery, St. Clair Coal Co., St. Clair.

**Bituminous Mines**—Thacker mine, Pond Creek Colliery, Williamson, W. Va.; Rock Springs No. 8 mine, The Union Pacific Coal Co., Rock Springs, Wyo.; Winifrede mine, Pond Creek Colliery, Williamson, W. Va.; Rockhill No. 5 mine, Rockhill Coal Co., Robertdale, Pa.; Sayreton No. 2 mine, Republic Steel Corp., Sayreton, Ala.; Dawson No. 6 mine, Stag Cannon Branch, Phelps Dodge Corp., Dawson, N.M.; and Patton Clay mine No. 1, Patton Clay Mfg. Co., Patton, Pa.

**Open-Pit Coal Mines**—Monitor Extension anthracite stripping, Philadelphia & Reading Coal & Iron Co., Locust Gap, Pa.; and Sayre bituminous coal stripping, Republic Steel Corp., Sayre, Ala.

## Two Pennsylvania Groups Hold First-Aid Meets

The Mine 35 team of the Berwind White Coal Mining Co. led a field of 27 teams with a score of 99.875% to take first place in the Central Pennsylvania Safety Association first-aid meeting held June 9 in the park of the Reitz Coal Co., Central City, Pa. Second place went to Mine No. 1 of the Acosta-Gray Coal Co. and third place to the team of the Ebensburg Coal Co. Cash prizes of \$50, \$25 and \$20, respectively, went to each man



## Virginia Tech Student Receives Old Timers' Award

THE FIRST VIRGINIA TECH STUDENT to be so honored, Chester J. Stull Jr. (left), Wharton, W. Va., receives an Old Timers' award watch from E. R. Price, general manager of coal properties, Inland Steel Co., Wheelwright, Ky. The presentation was made at a mining engineering dinner at the Faculty Center on the Virginia Polytechnic Institute campus and was attended by a number of prominent coal mining officials and 40 students in mining engineering and geology. Appearing in the foreground is Minor Pace, superintendent of preparation, Inland Steel Co.

on the three leading teams. A plaque presented by the NCA also was awarded to the winning team, and the second team received a plaque donated by the Mine Safety Appliances Co.

In the 5th annual first aid meet sponsored by the Moshannon-North Central Safety Association, held June 16 at Philipsburg, Pa., the Helvetia mine team of the Rochester & Pittsburgh Coal Co. was the winner among 16 teams with a score of 100. Placing second, third and fourth, respectively, were the following teams: Arcadia No. 1, Clearfield Bituminous Coal Corp.; Nos. 7, 8, and 9 mines, Mech Mining Co.; and Penn Mine No. 9, Elliot Coal Mining Co. Cash prizes for the four leading teams were \$210, \$150, \$90 and \$80, respectively.

## Illinois Open-Pit Group Holds Meeting July 27

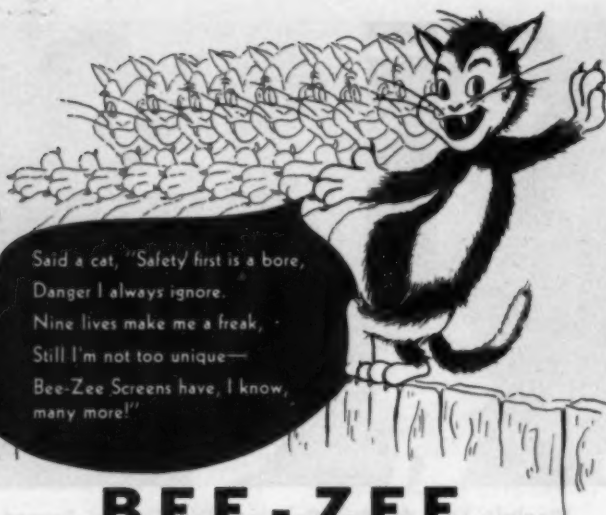
An extensive program will feature the one-day annual meeting of the Electrical Div., Open Pit Mining Association, to be held July 27 at the University of Illinois, Urbana, according to an announcement by L. E. Briscoe, electrical engineer, Ayrshire Collieries Corp., and secretary-treasurer of the association, Guy Shorthouse, United Electric Coal Co., will serve as chairman of the meeting, which will convene at 9:30 am, CDST, in Room 314 of the Union Bldg.

Registration will include a luncheon, cocktail hour and banquet and for the first time a special invitation is being extended to the ladies, for whom a special program including luncheon and a card party is being planned.

At the morning session, two speakers from the University of Illinois will be followed by presentation of a paper by George Reynolds, vice president of the Association, on "Electrical Sequence Control for Coal Preparation Plants." The remainder of the morning will be devoted to an inspection of the University's electrical laboratory.

The afternoon session will be opened with a program sponsored by the Bucyrus-Erie Co., followed by presentation of three papers: "Lightning Protection for Open-Pit Mining Equipment," by A. M. Opsahl; "Space Communication," V. S. Anderson, industrial communications counselor, Motorola, Inc.; and "Power-Factor Correction by Use of Amplidyne," R. B. Moore, General Electric Co. John Huey also will discuss the content and workability of an electrical reference directory of open-pit mining excavators prepared by the association for assistance to members.

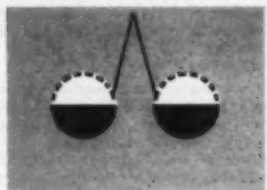
**YOU'LL FIND** some worthwhile "operating ideas" in the two special staff-written meeting reports beginning on pp 132 and 140 of this issue.



Said a cat, "Safety first is a bore,  
Danger I always ignore.  
Nine lives make me a freak,  
Still I'm not too unique—  
Bee-Zee Screens have, I know,  
many more!"

## BEE - ZEE Round Rod Screens Have EXTRA LIVES!

Make *more* money with screens that last 10, 20—even 30 times longer, as proved by reports from coal operators! Bee-Zee Round Rod Screens set these records for "extra lives" in plant after plant—and here's why:



### SCREENS TAKE PUNISHMENT LONGER

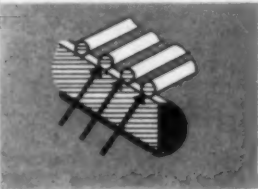
The stainless steel used for Bee-Zee Screens is of a special hard-wearing alloy that takes shock and abrasive action longer. Top and tie rods are spot welded together at every point—tension is built into the screen to resist stress and strain fatigue. Screen will not rust or corrode.

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Bixby-Zimmer catalog explains all the money-making features of Bee-Zee Round Rod Screens and their use in coal processing work. Write today—no cost or obligation.

### SCREENS STAY ACCURATE LONGER

Exclusive Bee-Zee round rod design means that top rods can wear halfway through without enlarging the screen opening. Smooth round top rods make fine point of contact with tie rods—offer no "pockets" for blinding or clogging. This means faster dewatering, too.



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Bee-Zee Screens can be fitted to any coal processing equipment.



### Old Timers' Club Honors Colorado Mines Student

DR. LEWIS E. YOUNG (right), consulting engineer, Pittsburgh, presents a gold watch to Harry Shively, selected as the outstanding student in coal mining from the 1951 Class of the Colorado School of Mines. The Old Timers' award was made at the Mines Alumni Banquet held in Denver May 24, at which Dr. Young was guest speaker.

### Briquetting Group Sets August Date

The 1951 Coal Briquetting Conference will be held Aug. 2 and 3 at Superior, Wis., under sponsorship of the Natural Resources Research Institute, Laramie, Wyo. This will be the first briquetting conference since 1949. The program will include technical papers, a visit to a nearby briquetting plant and two group dinners.

### Correcting the Record

The Editors regret the inaccuracy in the June Coal Show Report pointed out by Carel Robinson, Robinson & Robinson, mining engineers, Charleston, W. Va., who writes as follows:

"My attention has been called to an error in the report of my discussion of Mr. Crichton's paper at the American Mining Congress Convention held in Cleveland. This error appears on p. 105 of your June issue.

"I am reported as saying: 'Our firm considers the bridge conveyor almost as revolutionary as trackless mining was when first introduced, etc.' In my talk, I spoke only about the Piggyback conveyor and I am sure I made no mention whatever about the bridge conveyor. I will appreciate this being corrected."

### U.P. Old Timers Meet

Climaxing a two-day celebration June 15-16, at Rock Springs, Wyo., members of the Old Timers' Association of The Union Pacific Coal Co., met at the annual banquet on the 16th

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TONS PER MAN-DAY DEPEND UPON CONSISTENT OPERATION AT THE FACE. EQUIPMENT BREAK-DOWNS HERE CAN BE COSTLY FAR BEYOND THE PRICE OF A NEW MACHINE OR OF NEW CUTTING BITS.



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THE PROX TOOL STEEL BIT HAS BEEN DESIGNED AND ENGINEERED TO PROVIDE A MAXIMUM OF HARD CUTTING WITH A MINIMUM OF DOWN-TIME DUE TO BIT FAILURE.

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Preparing pipe ends is a cinch with the "Vic" Method... "Vic-Groover" grooves 'em automatically, twice as fast as a conventional pipe threader!

On your next piping job — new construction, repairs, or alterations — try the Victaulic Method and you'll save time, work, and money!

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27TH VICTAULIC YEAR

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to elect officers and hear addresses. Membership of the association is now 783, compared to 263 in 1926.

George A. Brown, retiring president, was toastmaster at this 27th of the annual reunions. I. N. Bayless, company president, spoke briefly on the company position and outlook, and the main address, devoted to the principles of good supervision and workmanship, was delivered by Dr. Kenneth McFarland, of Topeka, Kan.

Officers for the coming year were elected as follows: president, H. E. Buckles, Reliance; vice president, Ben King, Superior; secretary, Roy Sather, Rock Springs; and treasurer, J. D. Foster, Rock Springs.

The reunion was preceded, on June 15, by the annual company first-aid meet. Winners in the various divisions were: Men's—Reliance No. 11; Boy Scouts—Superior; Senior Girl Scouts—Superior Troop 1; and Junior Girl Scouts—Winton.

## Rocky Mountain Group Views Mining Methods

**Begins on p. 132**

foreseen in the near future, opening up new mining possibilities, such as full retreat from the boundary. Since these new developments will bring with them new problems in capitalizing on them, the industry must devote even more thought to improvement in mining systems and methods.

Mining practices at the properties of the St. Louis, Rocky Mountain & Pacific Co., in Colfax County, New Mexico, was the subject of a paper by William K. Dennison Jr., assistant engineer, Raton, N. M. Coal thickness averages 6 ft and openings are through the outcrop. Loading is done with Joy 8 BU machines served by  $2\frac{1}{2}$ -ton steel mine cars. Airox coal-breaking is the rule.

The working plan is based on panels 850 ft wide and 1,600 ft deep. As the panel entries develop, pairs of air rooms 18 to 20 ft wide on 50-ft centers are turned every 200 ft on both sides. Room depth is 200 or 400 ft, depending upon the panel plan being employed.

In some panels, cut-off entries are turned when the air rooms reach 200 ft and are advanced parallel to the panel entries, thus reducing room length to 200 ft. Room work from the cut-off entries is on the advance. As each room reaches its limit, the pillars are immediately extracted. When mining from the cut-off entries is completed, the inner block of coal is mined on the retreat to complete the panel.

Use of this system permits boosting production in a section to the maximum in a very short time, since pillars are being extracted beyond the cut-off while the main panel is being advanced. Also, the block of coal along each side of the main panel entry is

# NEW NAME TO RELY ON Safe, Sure Shot Firing Cord



Examine it in every detail and you'll find Hazard Redshot has everything you need and want in shot firing cord. It's service-designed and precision manufactured especially for safe, sure blasting in coal mining operations.

Insulation and sheath are combined in one single compound—tough, strong Hazaprene—proved beyond question for its durability in severe service. A uniformly thick, double wall of Hazaprene separates the parallel laid conductors, prevents shorting. This Hazard construction eliminates fibrous fillers which can absorb and retain damaging moisture...reduces conductor resistance...prevents "kinking" of cord in use...provides extra flexibility for easy coiling and uncoiling.

You'll also like the bright red color of Redshot which makes it highly visible; the grooved insulation for easy separation at connections; the quick way it strips clean

for easy splicing. Hazard Redshot Type RG Shot Firing Cord fully meets the flame-resistant requirements of U. S. Bureau of Mines and Pennsylvania Department of Mines. For free sample of new Hazard Shot Firing Cord, mail the coupon below today. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pa.

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Please send me a free sample of the new Hazard Redshot Type RG Shot Firing Cord.

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You can depend on WILLSON for protection against welding eye hazards because of the 100% tested quality of WILLSON-Weld filter glass.

Before the WW trade mark of WILLSON quality is etched on a filter lens, it has been tested for filtering out dangerous rays, graded for shade, inspected for correct thickness and diameter, optical quality, and visible flaws and scratches. The lens meets Federal Specifications backed by the WILLSON reputation for quality and integrity.

## Rocky Mountain Institute

reduced in thickness from 400 to 200 ft, permitting more rapid extraction when full retreat begins.

A modification of the cut-off system used in some sections is converting the air rooms into subentries by turning four rooms off them on 50-ft centers and driving them through to the next pairs of air rooms. This achieves the same results as the cut-off entries.

Extraction of individual pillars has been the subject of considerable study. Originally, when the panels had been fully developed, the 200-ft blocks between air rooms were split with three rooms on 50-ft centers. Extraction was based on driving skips across the ends of the pillars, leaving stumps and fenders as necessary. With this method, however, there was considerable heaving and squeezing on the entry, necessitating considerable brushing and retimbering, in addition to difficulties in extracting the chain pillars.

The present method is open-end extraction of blocks made by splitting the pillars between air rooms to leave blocks 96 ft wide and 200 ft deep. With a pillar blocked out, extraction is started by driving a place 20 to 25 ft wide across the back end, leaving a 6- to 8-ft fender, broken at intervals, against the gob. When the pillar has been holed through, two or three lifts are mined and then the process is repeated.

"This method has proved very successful," Mr. Dennison said. The entry is less disturbed as a result of reducing the number of rooms from three to one. With on-shift coal-breaking made possible by Airdox, fewer working places and greater concentration are possible. "Pillars can be prepared and cleaned up twice in a two-shift working day, if desirable. Thus, pillar extraction can be accomplished in a rapid and efficient manner." Also, "the open-end method assures a minimum of openings and maximum support. All work is confined to the back end of the block and pressure on the standing block is relieved by caving where the pillar has been extracted. With this present system, 85 to 90% extraction is obtained."

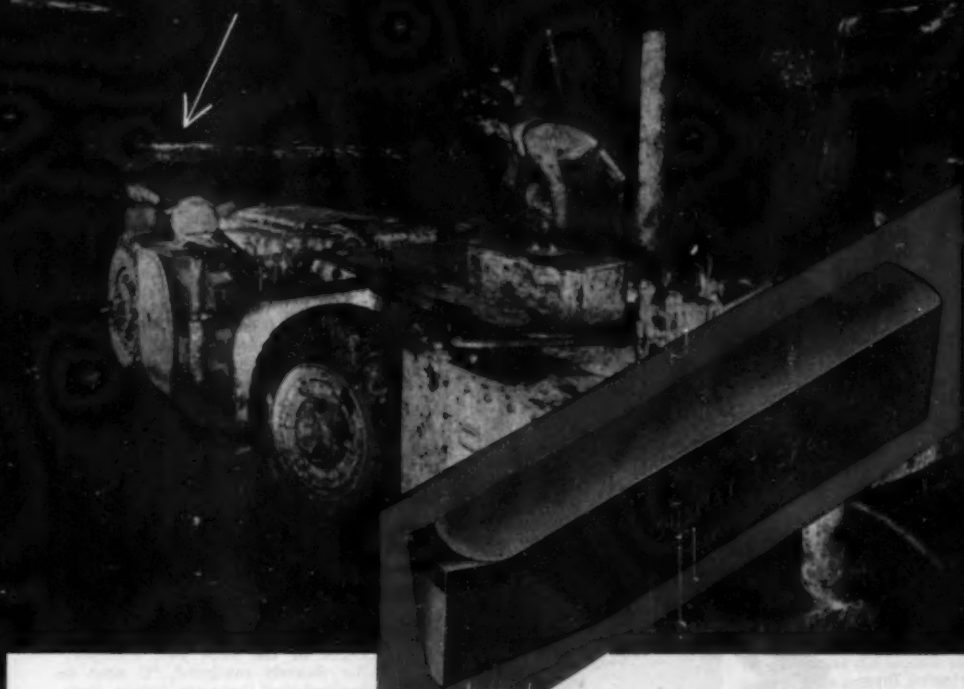
Bolts for roof control are increasing, Mr. Dennison reported. Wedge-type bolts 1 in in diameter and 5 ft long are used. In entries bolts are not supplemented with timber, except for an I-beam or crossbar at wide intersections for safety. Rooms are bolted their entire width as they are driven. However, as an added precaution, props in the gob have been continued. The bolts over the track take the place of crossbars and provide added clearance and safety.

Bolts have eliminated most of the retimbering formerly necessary — sometimes two or three times. "Bolts along with timbers in pillar sections have led to more positive roof control.



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## ..with JOY SULMET BITS

**PLACE AND CONDITIONS**—The seam varies from 4½' to 7' in thickness at this property. It is characterized by a hard slate band, 4" thick, approximately midway from floor to roof.

**FORMER METHOD**—Full seam mining was employed, the coal being undercut by a Joy 11-RU Universal Cutter. Excessive bit costs with their former bits made a shear cut impractical. The entire fall was loaded out and the slate picked out at the tibble.

**PRESENT METHOD**—The mine switched to Joy Sulmet SF Cutter Bits. The horizontal cut is now made in the slate band. A shear cut is made along the rib.

**RESULTS**—Hand-picking at the tibble has been eliminated, since the entire slate band is cut out and gobbled before the face is shot.

Powder costs are lower since a heavier charge was required to break the slate band.

Size consist has improved due to the lighter powder-charge required.

Cutting speed has increased, since bit-change time has been reduced considerably.

**These cost improvements are entirely due to the ability of Joy Sulmet Cutter Bits to cut hard impurities more easily than ordinary bits can cut coal.**

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DL 3461

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## COAL MEN ON THE JOB



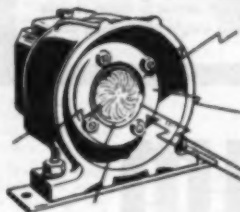
POWELLTON NO. 6 MINE, COAL DIV., EG&A: Topping all supervisors in safety and general efficiency performance during the last 9 mo of 1950 were these five foremen: G. E. Christian (second from left), Darst McKinney, Howard Ritz, A. P. Gilliam, and William T. Webb, flanked on the left by E. W. Potter, superintendent, and on the right by W. W. Hunter, general superintendent. The men received attractive wrist watches in recognition of their achievement at a dinner this spring for mine and company officials.

with stairways on each side for convenient inspection and maintenance. The belt is a 48-in wide unit, 8-ply nylon, 1,500 ft long, 415 ft lift, 700 tph at 400 fpm.

The goals and activities of the Defense Solid Fuels Administration were summarized by Charles W. Connor, administrator, in opening the second technical session, with George Bywater, U. S. Geological Survey, presiding. An earlier summary appears on pp 70-73 of this issue of *Coal Age*. Commenting, Mr. Pape observed that the West has a large shut-in production capacity, with coals leveling themselves to conversion to liquid fuels, and expressed his conviction that the government should take steps to utilize western capacity and thus benefit the western industry.

Definite cost advantages have been attained by Airdox coal breaking at the Wyoming and Montana mines of the Sheridan-Wyoming Coal Co., Inc., declared Walter J. Johnson, president, of Monarch, Wyo., in a complete description of the history of coal-breaking and of present practice. The Monarch mines, he pointed out, are producing a good quality free-burning subbituminous coal. On the other hand, its high moisture content is detrimental to the storage qualities of the prepared sizes, and consequently the coal must be dislodged as gently as possible to keep fracturing to a minimum and retard degradation as a result of air-slacking and jarring in handling and in transit.

Efforts to attain this goal over the years include use of black powder, pellet and permissibles, with black powder doing the better job though involving major safety and other disadvantages. A continuing search for a better medium led to testing of Cardox in the late 30's. As a result, 1938 was the last full year on powder, with a cost for powder, caps and wire

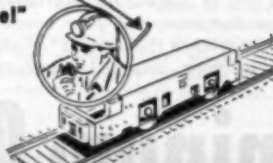


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Trolleyphone!*

What's going on in your mine? You'll know when you're there with a Trolleyphone! Femco's push-button talk gives you clear, two-way contact with motormen on the move, foremen at the face,—or anywhere you need better coal control! Keep in touch by Trolleyphone to track down those profits!

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- Constant Supervision
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**FARMERS ENGINEERING  
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**TROLLEYPHONE**  
"It Speaks For Itself"



## Mining Tires exactly fitted for their work

When we say "exactly fitted" we mean a mining tire built for the toughest conditions **OFF THE ROAD**, while giving a smooth long-wearing roll on the highway.

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These are the facts about the **U.S. ROYAL FLEETMASTER** which can contribute to a radical reduction in your tire costs.

These U.S. Royal Fleetmaster facts add up to reduced tire costs — increased efficiency — lower maintenance!

- ★ **70% Deeper Traction Tread!** (For complete holding penetration **OFF THE ROAD!** With long-wearing smoothness on the highway)
- ★ **Tougher, Stronger Carcass!** (Permitting even greater additional safe mileage with more recaps)
- ★ **Special Tread Compounds!** (Utmost in cut and chip resistance)
- ★ **Round-Moulded Carcass!** (Natural inflated shape reduces distortion strain)
- ★ **Thicker Under-Tread!** (Your bed-rock for super-traction and mileage)

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# UNITED STATES RUBBER COMPANY

## Measure Liner Economy In STRENGTH PER POUND



On a pound for pound basis, Armco Liner Plates cost less to carry a given load than any other type. That's because the corrugated metal design provides safe strength with no excess weight or material.

Armco Liner Plates are easy to handle and install. One man can carry, hold and bolt a section into place using only a hand wrench. Less bulk also means less excavation.

Other advantages include fire-resistance and freedom from excessive maintenance.

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### ARMCO LINER PLATES



**MORE SCRAP MEANS MORE STEEL • TURN YOURS IN TODAY!**

#### Rocky Mountain Institute

of 3.8c per ton. On a comparable basis, the Cardox cost in 1940 was 7.2c per ton, and the total increased cost, all items considered, was 2.88c per ton with Cardox.

Considering cutting and drilling in addition to other costs, the increase with Cardox was 6.14c per ton. However, it was found that the benefits more than offset the extra cost. These benefits included better top conditions, elimination of smoke delays, improved loadability, an increase in realization of approximately 5.1%, and a greatly improved customer reaction.

"Cardox was used exclusively and very satisfactorily in our Monarch operations from 1939 until 1948. While Cardox was doing a very fine job of breaking down the coal, there were, nevertheless, two conditions that we were desirous of eliminating. They were: (1) handling of shells; (2) because we were some 400 mi from our source of carbon dioxide, we were constantly concerned with a possible shortage . . . It soon developed that Airdox would positively relieve the two conditions."

Installation of Airdox at the Monarch operations required centralizing the compressors, in one instance, in an old mine with long haulage distances, with the idea of reducing steel line to a minimum, and, in the other instance, in a new mine in a location that would serve for a long period of time and still permit use of sufficient steel line to provide a receiver effect. The latter problem was solved by stringing additional line in coils. As the face advances, coils will be removed one at a time until the desired single-line distance for proper receiver capacity is reached—approximately 4,000 ft.

The cost of Airdox at Monarch, Mr. Johnson reported, "is proving considerably less than Cardox." The saving at the present time in charges for leased equipment, additional supplies, handling of Cardox, advancement of Airdox lines, cutting, drilling, etc., is 5.88c per ton. The gain in realization is not too noticeable, although customer reaction is even more favorable.

At the Roundup (Mont.) property of the company, coal for the domestic market also is a prime consideration, and the history of coal breaking, Mr. Johnson observed, parallels closely that at Monarch. The net gain, when the change to Cardox was made, was 15c per ton, largely a result of increased realization. The further step to Airdox reduced material and supply cost from 17 to 7.4c per ton. In addition, the cost of the Cardox plant and the cost of distribution was eliminated—a further saving of 9 to 10c per ton.

"In summarizing our experience to date," Mr. Johnson concluded, "we can safely say that we are obtaining



*Prompt Delivery*

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river and lake TERMINALS

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LUBRICANTS for every purpose carefully compounded from the choice Pennsylvania and Mid-Continent base crudes.

Ashland's eight refineries all produce quality diesel fuels. Their location means prompt shipments can be made to any adjacent areas. In addition, Ashland maintains one of the largest inland waterways fleets, consisting of both river and lake boats and tows. Fleets of trucks and railway tank-cars and pipe lines quickly move Ashland fuels from river and lake terminals to customers throughout our ever-expanding marketing area.

You can depend on Ashland for quality as well as quantity. Carefully controlled refinery production assures uniform quality fuels made to meet diesel engine manufacturers' specifications.

From the Ashland group of refineries comes a complete line of lubricants, each engineered to meet specific lubricating problems of diesel engines and other operating equipment. Write for complete details, or consult our engineers on your fuel and lubrication problems.

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Flint, Mich. — Philadelphia, Pa. — Pittsburgh, Pa. — Roanoke, Va. — Richmond, Va. — Savannah, Ga. — St. Louis, Mo. — Toledo, Ohio —  
Trenton, N.J. — Washington, D.C. — Wilmington, Del. — York, Pa.

Ever wonder why you never see a scowling, fagged operator on the Baker, A-C team? Here's why:

They just plain love that "doze-in-your-armchair" ease of control; that positive hold without throttle jockeying; that fraction-of-an-inch accuracy . . . that quick, direct lift; that positive down-pressure which puts almost all the tractor weight on the cutting edge; and the "roll-action" of the blade which leaves more tractor power for push. Because "Easy DOZE It!"

That's why you see the Baker, A-C team more and more wherever dirt has to be moved fast and efficiently. When operators prefer it, you can count on it being the best money-maker.

Specify Baker Bulldozers, Gradebuilders or Root Rippers for your new A-C Tractors . . . Baker makes engine-mounted hydraulic control models and cable-control models for the entire line of Allis-Chalmers crawlers. See your Baker, A-C Dealer. THE BAKER MANUFACTURING COMPANY, Springfield, Illinois.



P.S.: Baker is the PIONEER and the SPECIALIST in bulldozers

## COAL MEN ON THE JOB



TRUAX-TRAER COAL CO.—Russell H. Wilmet, superintendent, Ceredo preparation plant, Ceredo, W. Va.

better face preparation at Monarch and at Roundup than either of these properties has ever experienced. In addition, with all considerations carefully weighed, we are obtaining these results very safely and economically. It is only with further improvements in product and service that we can hope to compete against these serious inroads of other fuels into our domestic market."

The concluding event of the second session was a discussion of engineering training for coal mining, with Carl J. Christensen, dean, School of Mines and Mineral Industries, University of Utah, leading off. The number of students applying for mining engineering, he pointed out, is all too few, perhaps because the coal-mining industry is not too attractive. The future will bring a need for many more engineers, and if they are to be available, he asked that the industry interest itself more in increasing the flow of men into the mining schools.

Discussion following Dean Christensen's comments brought out opinion that one reason why coal mining may not be attractive is starting pay, and the fact that young men are kept on lowly jobs perhaps too long, resulting in discouragement, in addition to failure in utilizing their mental capacity and training. Also, discussion brought out that where the right kind of a missionary job is done, young men can be persuaded to take mining courses.

Procedure, goals and results of the second underground gasification experiment at Gorgas, Ala., being carried on jointly by the Bureau of Mines and the Alabama Power Co., were presented at the opening of the third technical session by James L. Elder, supervising engineer for the Bureau. Paul L. Shields, president,

**We Mobilize for Freedom**

# WHY Controls are Necessary

One of the encouraging characteristics of the American people is their dislike for government controls. This augurs well for the future of their economic and political freedom.

But for the next few years we must not only tolerate but also help to make effective a whole battery of emergency government controls over our economic life. If we fail to do this now the future of that freedom we cherish will be imperilled. It is the purpose of this editorial—the third in a special series—to explain in simple terms why this is so.

After our military victory in World War II, we rushed through a demobilization which cut our military strength to about one-tenth of its wartime peak. Our allies did much the same thing. But the Russians maintained much of their wartime military strength and built up that of their satellites. With prodigious speed we switched from military to civilian production and went on to enjoy a rousing postwar boom—the greatest in our history.

This boom was in vigorous progress when, on June 25 last year, the Russian-sponsored North Korean army attacked South Korea. Our industrial production was rolling along at almost twice its prewar level. We had labor shortages in many key industrial areas. Under the impact of heavy buying all along the line, prices were climbing.

When the North Koreans smashed into

South Korea they smashed into our national consciousness this fact: if we want a fair chance to save our national freedom from destruction by Communist aggression, we must race to restore some of the military power we had so speedily written off after World War II. And we must do it with our resources already very fully occupied with a boom in civilian business.

## **Program Small Compared to World War II**

Compared with our military effort in World War II, the mobilization on which we are now embarked is small. At its peak, under present schedules, it will absorb no more than one-fifth of the total national production. During World War II we reached a point when nearly half of our total production went for war-making.

Moreover, our economy now is much bigger and stronger than it was in World War II. During the last decade there has been an increase of about 15 percent in our labor force. Our workers have had the training advantage of steady employment. The capacity of our industrial establishment is two-thirds again as great as it was ten years ago. Since the war no less than \$70 billion has been spent to expand and modernize it.

Given time, the industrial giant we have created could pick up in its stride the added load of production for defense that now is con-

templated. But speed is of the very essence. There is little dissent from the proposition that if we are to stand off Russian aggression successfully we have, at the outside, two years in which to get ready.

### **Controls Needed to Prevent Chaos**

These two facts — (1) the necessity for speed in our rearmament program and (2) an economy already stretched taut by a record civilian boom—create the general necessity for government controls. If we simply pile the billions of added defense expenditures authorized since last June on top of the civilian boom, and let it go at that, two destructive developments would follow. There would be a scramble for scarce materials, notably metals, which would create chaos in those markets. And prices would go through the roof.

Our situation during this mobilization is radically different from what it was when we rushed to get ready for World War II. Then we started with an economy that was coming out of a long depression. There was plenty of slack. Even in mid-1941 we still had over 6 million unemployed. Thus it was possible for us to expand war production greatly and also increase civilian living standards before the limits of our productive capacity made extensive controls necessary. But as we begin this new mobilization we find our economy already operating virtually at capacity. This fact is of key importance in understanding why this relatively small defense program so quickly requires the imposition of controls.

The selection and administration of controls thus far has been badly bungled. The threat of price controls, for example, was broadcast so vigorously and for so long that our people were virtually asked to raise prices and thereby do much to defeat the controls. Adequate taxation directed so as to attack inflation at the source and thus give direct price control a chance to operate has not yet been provided.

Indeed, we could readily assemble a long and devastating catalog of the deficiencies of

the government's control program. But that would not dispose of the necessity for controls—by priority, by allocation, and, as a stop-gap, by direct prescription of selling prices—if we are to carry out our mobilization successfully. That is the only means by which a clear right of way for defense production can be cut through the highways of trade and commerce now jammed with civilian boom business.

### **Hope In The Wilson Plan**

Since he became Director of Mobilization, Charles E. Wilson has added a new element of order and hopefulness to the mobilization program. He has laid out a plan which, if we are spared all-out war, would do three things by 1953. First, it would produce the weapons needed by our army and our allies to meet an immediate threat. Second, it would create the capacity that would enable us to move at high speed into weapons production for all-out war—if necessary. Third, it would create the additional production capacity that would restore by that date our ability to resume the climb of the American civilian standard of living.

In technical and industrial terms the Wilson Plan seems to be feasible. If it is successfully carried out, we should be able to begin getting rid of controls rapidly by 1953. But to carry out the program successfully, it must now have vigorous support from everyone. That does not mean mere agreement that it is a good plan. It means that we must conform to the controls that are necessary to make the plan work. In developing this support, the business community is in position to exercise crucially important leadership.

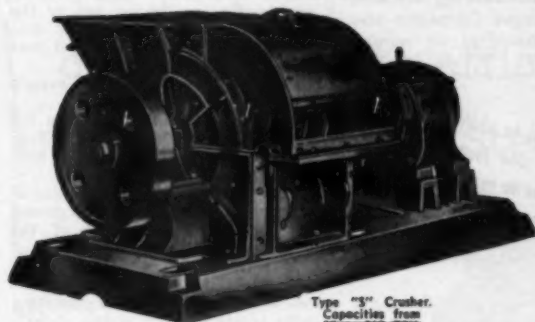
As has often happened in our national history, we are confronted by a paradox. We must accept emergency controls for the time being to insure survival of the freedom that they infringe. But, as we do this, we may find some comfort in the reflection that while controls from Washington are hateful, controls from Moscow would be infinitely worse.

**McGraw-Hill Publishing Company, Inc.**

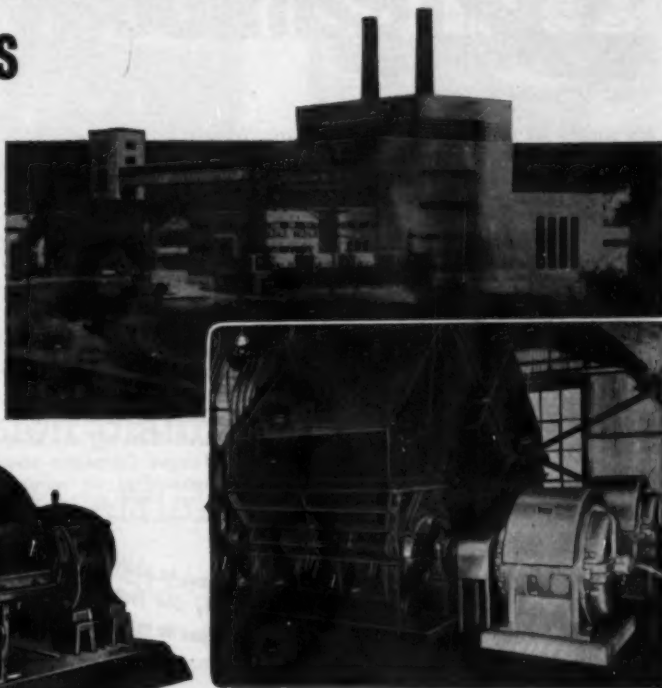
# TWIN AMERICAN CRUSHERS PRODUCE 3,570,000 TONS OF CRUSHED COAL IN 5½ YEARS

**16" ROM**  
**Reduced to ¾" at**  
**900 Tons Per Hour**

The Ohio Power Company Tidd Plant  
of Brilliant, Ohio



Type "S" Crusher.  
Capacities from  
25 to 500 TPH.



Note the compactness of areas in which these two direct  
motor-connected 60S Americans are installed

In commercial service since September, 1945, at the Tidd Plant of The Ohio Power Company, Brilliant, Ohio, the twin American 60S Crushers shown in the installation above have reduced 3,570,000 tons of 16" run-of-mine bituminous coal to a ¾" product.

Even with this record, these crushers—each rated at 450 tons per hour—were not fully loaded until November 1, 1948, when the plant started commercial service of its second turbogenerator.

## **Crushers Now Handling 420,000 Tons Per Unit Per Year**

Close to half a million tons per unit . . . the dependable, uniform, high tonnage at The Ohio Power Company plant is typical of American performance. Rugged Americans are producing unfailingly at other plants throughout the world, too—offering a complete once-through crushing plant in one compact unit.

Get the full details on efficient power plant coal reduction.  
WRITE for Bulletin "CRUSHING COAL AT LESS THAN 1¢ PER TON"

**American** PULVERIZER COMPANY  
*Originators and Manufacturers of  
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# 20-Ton Dreamboat

It's simple for the operator to get more work done . . . to maintain higher average speeds hour after hour . . . with this big and more powerful Allis-Chalmers HD-20 Tractor.

For the Diesel engine power is put to work through a Twin Disc Hydraulic Torque Converter. Auto-

matically and instantaneously, this unit masterminds torque-power output . . . varies the torque developed by the engine as the load varies.

Hard-to-handle loads are handled easily—without gearshift guesswork. And, this hydraulic unit cushions shocks to protect the equipment.

That's why strip mine operators call this Twin Disc Hydraulic Torque Converter equipped tractor a dream-boat. And that's why, too, you find this hydraulic unit on so many other units where tractive effort is required. Test a Twin Disc Hydraulic Torque Converter also on your locomotives or mining trucks.



Faster than the operator could decide it might be time to shift gears, the Twin Disc Hydraulic Torque Converter automatically and instantaneously increases or decreases the torque output of the engine to meet the demand of the load—with no delay.



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## Rocky Mountain Institute

Spring Canyon Coal Co., presided.

Results of the first experiment at Gorgas in 1946-47, Mr. Elder stated, were sufficiently promising to warrant further investigation with the result that the second was set up in 1948, and actual gasification was started March 18, 1949. "The preliminary experiment showed that it was not too difficult to maintain combustion of coal underground, that the coal in place could be completely gasified, and that the high temperatures developed underground softened the overburden adjacent to the coal bed, thus allowing it to flow into voids and force intimate contact between the reacting materials.

"In the second experiment in underground gasification it was planned to utilize the principles of the 'stream method,' wherein contact between the gas-making fluids and the coal face depends on reaction of the overlying strata similar to that of the first experiment. It was decided to use a straightline passage in the coal bed, connecting the inlet and outlet to gasify the coal this exposed, and to advance the combustion face over a considerable area of the bed by the construction of new inlets and outlets off the line of the original passage as needed."

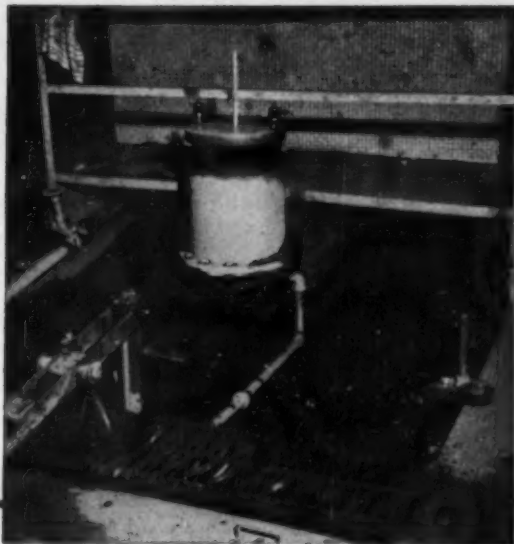
Objectives in the second experiment were:

1. Extraction of the energy in the unmined coal and development of fundamental knowledge dealing with underground gasification.
2. Determination of the quantity of coal that can be gasified underground and the scope and extent of the burned-out areas.
3. Determination of the quality and quantity of the gas.
4. Determination of the operating characteristics of the system, including optimum passage length, rate of fluid flow and pressure drop encountered.
5. Development of data on the action of heat on the overlying rock.
6. Development of fundamental technical and economic information regarding choice of plant site, installation and operating procedure, including installation and use of air inlets and gas outlets of the vertical borehole type.

After describing the gasification set-up and operating procedure, Mr. Elder summarized as follows:

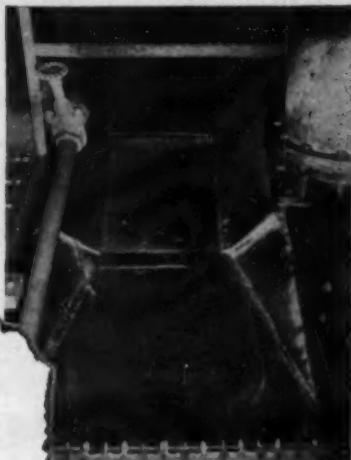
"The second experiment in underground gasification at Gorgas was operated continuously 22½ mo without great difficulty. During operation, a total of 10,485 tons of moisture- and ash-free coal was consumed, covering an area of 83,690 sq ft, or 1.92 acres. It was possible to extend the area of gasification by drilling boreholes off the line of the original passageway.

"Gaseous products having a heating value of 90 to 160 Btu per cu ft were produced at times, whereas at other



Two flumes that carry coal from conveyor to wash box at Sunnyhill's New Lexington preparation plant are made of U-S-S Stainless Steel.

Close-up of the left-hand flume after cleaning.



"Our preparation plant  
couldn't operate efficiently  
without Stainless Steel"

—says WILLIAM H. THOMA, Chief Engineer  
Sunnyhill Coal Co., New Lexington, Ohio.



STAINLESS STEEL's exceptional resistance to corrosion and wear has made it a highly valued material at the New Lexington, Ohio, preparation plant of the Sunnyhill Coal Company. In fact, William H. Thoma, Chief Engineer, Preparation, goes so far as to say, "This plant could not operate efficiently without Stainless Steel."

Stainless Steel shaker screens, used for sizing and dewatering at the plant, have demonstrated they'll far

outlast other types of screens, while handling several times the tonnage.

Sunnyhill now has recently installed Stainless Steel flumes to carry coal from the raw coal conveyor to a McNally-Norton 5-cell, 2-compartment wash box. Other materials formerly used on this job wore out within six months to a year. Rusting caused coal to build up in the flumes.

On the basis of past experience with flumes of other materials, Sunnyhill is confident that Stainless

Steel's long life and freedom from corrosion will prevent piling up of coal in flumes . . . will greatly reduce replacements . . . will continue to effect further worthwhile savings in labor and shutdown time.

A booklet describing the varied uses of U-S-S Stainless Steel in Sunnyhill's preparation plant may be obtained by writing to United States Steel Corporation Subsidiaries, Room 4265, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

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SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

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## adjust feeder or trolley wire INDEPENDENTLY!

*with exclusive Elreco Combination Clamps*

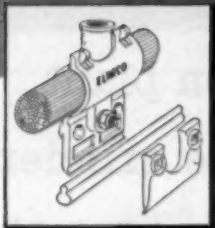
You support feeder cable and trolley wire *independently* when you use exclusive Elreco Combination Clamps. This means that either trolley wire or feeder line may be installed, adjusted, repaired or removed at any time *without* disturbing the other.

Elreco engineers developed this clamp to give the mining industry the most practical means of supporting feeder and trolley wire ever devised. Made of heavy ribbed malleable iron castings, the Combination Clamp may be attached to any standard insulated hanger.

Elreco manufactures the *only complete line* of feeder and trolley wire supports. Duplex Spacer Clamps for supporting the trolley wire directly under a feeder make possible additional feeder capacity and insure an extremely flexible mounting where "headroom" permits.

The entire line is available in 5 sizes for Fig. 8, grooved or special No. 9 trolley wire, feeder cable from 0000 to 1,500,000 circular mils.

Write today for price and delivery information on our complete line of feeder and trolley wire supports. Address me personally, c/o Elreco, 2917 Cormany Ave., Cincinnati 25, Ohio.



Serving the mining industry since 1892

**THE ELRECO CORPORATION**

A COMPLETE LINE OF TROLLEY MATERIAL FOR EVERY MINE

*E. K. McKee*  
PRESIDENT

### Rocky Mountain Institute

times the energy of the coal was brought out as sensible and latent heat.

"The use of fluidized sand to increase contact between coal faces was partially successful. High rates of fluid flow were favored, both from the standpoint of decreasing heat losses due to moisture and to obtain higher rates of coal consumption. Quadrupling the surface area of coal face exposed to reaction increased the rate of consumption of coal by a factor of 2.5.

"Leakage of gases from the system gradually increased with time. This leakage was influenced by the drying of the overlying strata, as well as by settlement and subsequent cracking."

Concluding, Mr. Elder stated that the project still is an experiment and that the problems are control of the gas-making fluids and getting intimate contact at the faces, with sand fluidization and placing holes close to the face apparently holding the promise of material help. To date, it appears that gas can be produced for heat and power, but as yet oxygen has not been used to produce a synthesis gas. A new installation is being constructed by boreholes to a seam 60 ft below, and in about three weeks electrodes will be installed to experiment with carbonization without preliminary driving of underground passages.

How to improve seeing conditions in coal mines, by C. M. Cryslar and G. F. Prideaux, Nela Park, General Electric Co., prepared for the 1951 Coal Show (June *Coal Age*, p. 111) was presented by Dean Jenks, G. E. lighting engineer, of Salt Lake. Among the major points made in the paper were: (1) the value of whitening surfaces underground by white-washing or rockdusting to promote seeing, and (2) a recommendation that a man at each mine be delegated to promote seeing conditions. In addition, the authors urged dust control and the use of the best possible lighting equipment. The results are fewer accidents and increased efficiency.

Roof-bolt pull and torque tests provide extremely valuable data on installation and holding power, declared R. B. Moore, Union Supply Co., Denver, in describing a pull-testing unit developed by his organization and how it can be used. The advantages of pull and torque tests, he pointed out, are:

1. Greater safety and a possible saving in materials and installation cost as a result of better matching of bolt length and other factors to the nature of the top, with the goal as the best possible anchor. Pull tests also permit taking care of variations in roof character, and before bolting is undertaken will show if it is practicable.

2. Exact determination of the size of hole needed, thus saving time and

**PRINTOMATIC DIAL SCALE**  
for accurate automatic weighing with  
weights recorded on tape or cards



**COUNTING SCALE**  
for fast, accurate counting  
of parts or pieces. Also  
made in dial types



**TYPE REGISTERING  
BEAM SCALES**  
assure fast, accurate  
weighing with weights  
recorded on a card.  
Non-registering beams  
also available.



**PORTABLE DIAL SCALE**  
accurate weighing, direct  
reading dial for easy,  
fast operation.



**OVER-AND-UNDER  
SCALES**  
for fast, accurate  
package filling and  
check weighing



**DIRECT READING  
BENCH DIAL SCALE**  
no mental calculation  
necessary—reduces chance  
for human error.



**Accurate  
Every  
Weigh...**

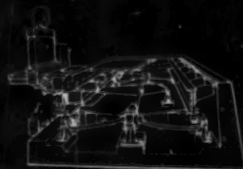
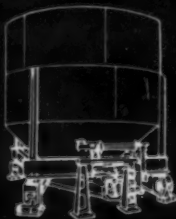
*In Scales, the Name is . . .*



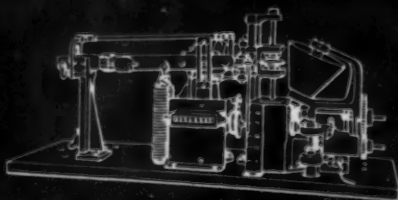
**FAIRBANKS-MORSE,**  
*a name worth remembering*

SCALES • PUMPS • ELECTRIC MOTORS • GENERATORS  
LIGHT PLANTS • DIESEL, DUAL FUEL AND GASOLINE ENGINES

**TRUCK SCALES**  
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Made in service than any other make.



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for accurate weighing of grain and other  
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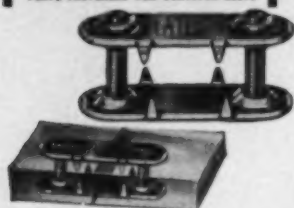
**BELT CONVEYOR SCALES—**  
provide fast, accurate weighing and weight  
recording of material in transit.

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durable, accurate scales in a wide range  
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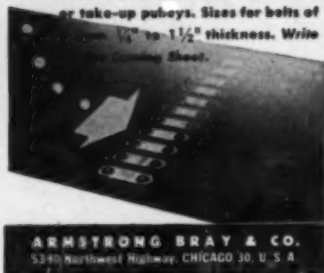


# PLATEGRIP

PLATE FASTENERS FOR CONVEYOR BELTS



Make strong dust-tight, water-tight joints in belts of any width. Special design spreads tension uniformly across belt, allows natural troughing of belt and assures smooth operation over flat, crowned or take-up pulleys. Sizes for belts of 1/4" to 1 1/2" thickness. Write for Catalog Sheet.



ARMSTRONG BRAY & CO.  
5240 Northwest Highway, CHICAGO 30, U. S. A.

eliminating failures. In softer strata the holes can be smaller; in hard strata, they must be increased, the latter also favoring drilling speed and reducing sticking of steels.

3. The psychological effect on management and men as a result of seeing what a bolt actually will hold.

Testing, Mr. Moore declared, will prove that bolting is safe, economical and fast. Mr. Moore concluded by showing an experimental roof bolt developed by the Colorado Fuel & Iron Corp., consisting of a strip of half round doubled and threaded on one end, thus providing a slot for its entire length. The bolt, he pointed out, permits drilling larger holes and the use of longer wedges; also, it is cheaper and provides anchorage the full length of the hole.

How a proposed new panel system of room-and-pillar recovery in steeply pitching low coal seams, employing shaker conveyors and belt haulage, compares with the system previously employed was the subject of a paper by J. Q. Berta, planning engineer, Union Pacific Coal Co., Rock Springs, Wyo. Pitch is 14 to 22%, and the previous system was to drive cross-pitch entries on centers of 330 ft and retreating one room at a time per entry.

Under the new system, panels will be developed 2,000 ft up the pitch. The panels will be 715 ft apart, with rooms turned both ways, thus mining

## COAL MEN ON THE JOB



REESE H. NICHOLS, since 1940 safety director of the Pittsburgh Coal Co., Div. of Pittsburgh Consolidation Coal Co., is shown at his desk before his retirement at the end of April after some 40 yr of service with the company. Mr. Reese was honored at a dinner held at the Fort Pitt Hotel by a group of his friends who presented him with a new outboard motor as a token of their esteem.

with one panel entry an area equivalent to that mined with six normal cross-pitched entries. After development with three shakers in three headings feeding to a belt in the center, the panels will be mined with two shaker-equipped rooms on each side, starting at the top. Total production from a panel, with a coal height of 4 ft, will be approximately 700,000 tons, or the same as that produced with six normal entries.

In the proposed system, savings in development and auxiliary facilities are estimated as follows: narrow work, 22,290 against 26,400 ft, or 0.35c per ton; track work, 2,445 against 15,000 ft, 2.84c; trolley, 2,245 against 14,670 ft, .032c; brushing, 1,087 against 6,697 cu yd, 8.00c; air-lock doors, nine against four sets, 0.36c; overcasts, one against two, 0.29c; total, 12.16c per ton.

Comparative labor is as follows:

	Panel System	Entry System
Unit foremen	1	2
Machine men	4	4
Duckbill operators	4	4
Facemen	4	4
Loading-head men	1	4
Motormen	1	2
Utility men	1	0
Total	16	20

Thus the saving in labor is 4 man-shifts, or 15c per ton.

In addition, the new system eliminates 63 room-necks where the last cuts must be loaded by hand, five

# Big Producer...

The MAMCO Dipper

For Cleaner Coal—

Faster Loading—Larger Capacities



CHECK THESE OUTSTANDING FEATURES:

- ✓ Wide mouth, shallow body for low coal seams
- ✓ Flat lip and long sharp teeth—parts coal at seam
- ✓ Tapered body with larger opening at the rear for quick dumping
- ✓ Tough, rolled steel plate body—lighter in weight—greater in strength
- ✓ Cast manganese steel lip with inserted manganese steel tooth points—for greatest resistance to shock and abrasion
- ✓ All welded construction—no rivets to work loose

Capacities up to 7 Cu. Yds.

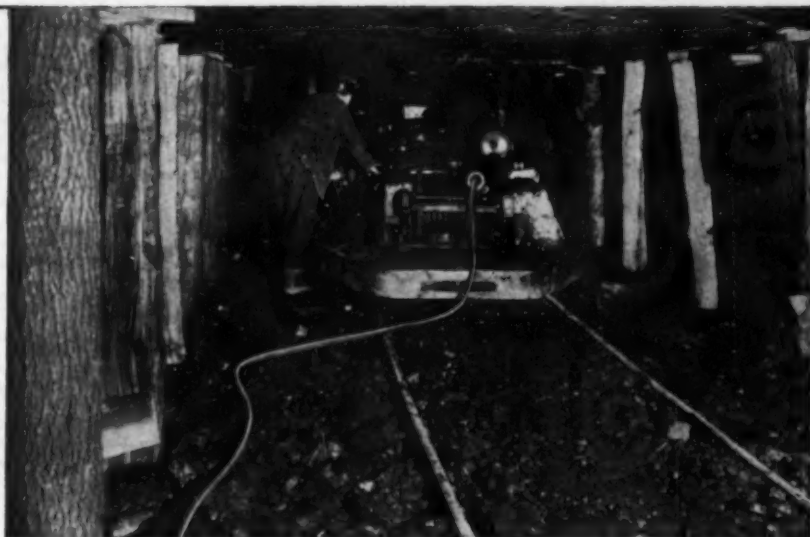
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ALTOONA, PA.

MATERIAL HANDLING EQUIPMENT

COAL PREPARATION PLANTS — OPERATING SUPPLIES



## Too Tough for Trouble....

One of the most important achievements of the research staff of the United States Rubber Company has been the development of an extremely tough Neoprene jacket compound. After carefully studying Mining Cable requirements, this Neoprene jacket has been applied to U. S. Royal Trailing Cable...making it one of the longest-wearing, most dependable cables available to the mining industry.

Use U. S. Royal where it will suffer the hardest wear. It is one cable actually too

tough for trouble. Rely on it for thorough safety. Depend upon U. S. Royal for uninterrupted power flow. For full information, write to address below.

### U. S. Royal Cables EXCEED A.S.T.M. Requirements

	A.S.T.M. D752 Requirements (Minimum)	U. S. Neoprene Jacket Com- pound Typical Values
<b>ORIGINAL</b>		
Tensile strength, lbs./sq. in.....	1800	3600-3800
Modulus @ 200% elongation, lbs./sq. in.....	500	1000-1200
Elongation, per cent (from 2")...	300	450- 550
Set test, in inches.....	2 1/4 (Max.)	2 1/4-2 1/2
Tear test, lbs.....	....	80- 100
<b>AGED</b>		
96 hours in oxygen bomb @ 70C.		
Tensile strength, lbs./sq. in.....	1800	2800-3000
Elongation, per cent (from 2")...	250	400- 450
<b>AGED</b>		
168 hours in air oven @ 70C.		
Tensile strength, lbs./sq. in.....	1600	3800-3000
Elongation, per cent (from 2")...	250	400- 450
<b>OIL TEST</b>		
18 hours in oil @ 131C.		
Tensile strength, lbs./sq. in.....	60	65- 70
Elongation, per cent (from 2")...	60	65- 70



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One of six Model F-45 Syntron Feeders in a coal preparation plant. Mounted on a downslope of 15°, each handles 40 TPH of minus 1/4 x 28 mesh, 30% moisture, slack coal to driers.

### VIBRATING GRIZZLIES

Used in heavy tonnage coal preparation for simultaneously feeding and coarse sizing of run of mine coal in volume flow.

### PICKING TABLES

Feed with a very short vibration stroke that assures higher picking efficiency with less fatigue to the pickers.

### VIBRATING SCREENS

Screening material wet or dry... with single or multiple decks. Used to bypass fines and size the product for separate bins.



VIBRATING GRIZZLIES



PICKING TABLES



VIBRATING SCREENS

## DIRECTED TO YOUR NEEDS TOP PERFORMANCE AND EFFICIENCY

Syntron Vibratory Equipment is designed with your material handling problems in mind and can be engineered to your present processing system with minimum change.

Syntron offers effective material handling thru variable control of rate of flow... from a trickling dribble to a gushing torrent... at the turn of the dial. The absence of mechanical wearing parts... gears, sprockets, cams, etc... means savings for you in low cost maintenance and replacements and in outstanding performance value.

Each Syntron product comes in a variety of models for small volume or heavy tonnage material flow.

### OTHER SYNTRON PRODUCTS

ELECTRIC VIBRATORS	CONVEYOR FEEDERS	DEWATERING SCREENS
VIBRATORY FEEDERS	BATCH WEIGHING TEST SIEVE SHAKERS	WEIGH FEEDERS

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CATALOG  
DATA

SYNTRON COMPANY

## Rocky Mountain Institute

power crossovers, five telephones and 44 temporary stoppings, in addition to providing a better opportunity for loading cars. Belts must be installed, but moving shakers in the development of 4,000 ft of entry is saved.

"The principal advantages of the proposed panel system," said Mr. Berta, "can therefore be listed as follows:

"1. A reduction in the amount of development or narrow work.

"2. Elimination of rock work in five haulage entries.

"3. Elimination of tracks, trolley and doors or overcast in these entries.

"4. Savings in mine labor due to more efficient grouping of the equipment.

"5. Elimination of one locomotive.

"Taking into consideration the above five major items of indicated advantage over the present system, the projected savings against the 700,000 tons to be removed from the area is 27c per ton. The capital outlay for the belt approximates \$75,000, but with the saving of one locomotive brings about an additional depreciation charge, based on a 15-yr period and 200 working days per year, in the amount of 4c per ton.

"An additional power cost of 1c per ton for the operation of the belt must also be deducted from the indicated savings of 27c per ton. Therefore, subtracting the additional depreciation charge of 4c and the additional power cost of 1c from the indicated saving of 27c per ton produces a net saving of 22c per ton to be expected from using the proposed panel system as compared to the present entry system."

Continuous loading with bridge conveyors and a symposium on safety were features of the concluding technical session, with A. P. Cederlof, Peerless Coal, Inc., Salt Lake, presiding. In discussing the design and use of bridge conveyors, A. B. Crichton Jr., vice president, Johnstown Coal & Coke Co., Johnstown, Pa., expressed the belief that all agree that the theory of continuous mining is sound, but that applying it has some practical aspects. Outlining some of the problems involved in continuous mining, he made the point that it proves nothing to install equipment unless it will improve the situation. The goal is merchantable coal at a profit, and the development of the bridge conveyor was an effort to solve a problem with these goals in mind.

Conditions to be met included a relatively new mine producing excellent coal from a 30- to 55-in seam with good roof, with a product running 75% plus 1/4 as a result of air breaking, a good market for domestic coal 9 mo of the year, AC all-belt mine with the conventional equipment of shortwall cutters, crawler loaders and shuttle cars, supplemented by flexible-shaft drills and washing of 1/2 x 1/4.

To mine coal, you need the right kind of drill.

this



not this

Same way with trucks.  
Get one that fits the job!

Switch to dependable  
**DODGE** *Job-Rated* **TRUCKS**  
for more power!



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**New Dodge “Job-Rated” trucks are the most powerful in Dodge history**—with up to 20% greater horsepower than ever. And you can haul more coal per trip because of scientific weight distribution—plus increased rear axle capacity on many models.

More than that, today's Dodge “Job-Rated” trucks give you new ease of handling, easier bad-weather starting and a host of other brand-new advantages!

Find out from your nearby Dodge dealer how a truck that fits your job will save you money.

**“Job-Rated” TRUCKS DO THE MOST FOR YOU**

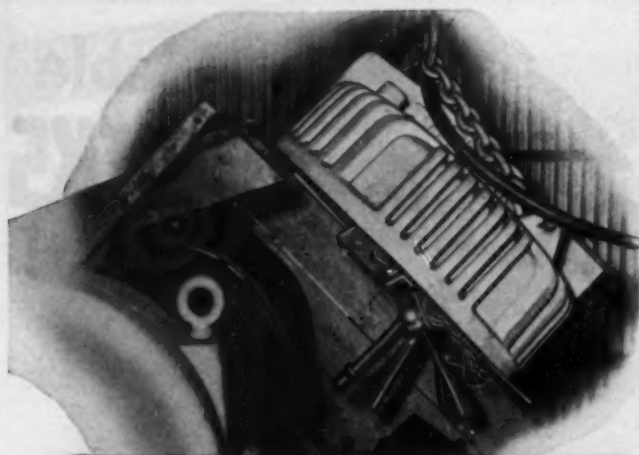
### How a Dodge Truck Is “Job-Rated” for Coal Mining

A Dodge “Job-Rated” truck is engineered at the factory to fit a specific job . . . save you money . . . last longer.

Every unit from engine to rear axle is “Job-Rated”—factory-engineered to haul a specific load over the roads you travel and at the speeds you require.

Every unit that **SUPPORTS** the load—frame, axles, springs, wheels, tires, and others—is engineered right to provide the strength and capacity needed.

Every unit that **MOVES** the load—engine, clutch, transmission, propeller shaft, rear axle, and others—is engineered right to meet a particular operating condition.



## REMOVE TRAMP IRON

*Before* **DAMAGE Starts!**

Here is the positive, economical way to protect crushers, grinders, pulverizers and other vital equipment — use a STEARNS Suspended Magnet over your conveyor or head pulley.



### CIRCULAR SUSPENDED MAGNETS

**Stearns** Suspended Separation Magnets are powerful units for removing tramp iron from various kinds of conveyed materials where protection to crushers and other processing machinery is necessary. Eliminating foreign metal means fewer repair bills on crushing equipment, fewer shutdowns and higher production.

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**Stearns** Suspended Separation Magnets are available in both circular and rectangular construction in all sizes to meet your needs. Easy to install and having low operating and maintenance costs, STEARNS Suspended Magnets are your best insurance against the tramp iron nuisance.

Whether your problem is the fairly simple job of tramp iron removal or the concentration and beneficiation of complex ores, STEARNS has EXPERIENCE ENGINEERED equipment to meet your requirements. Tell us about your problem; complete recommendations without obligation.



**Stearns** **MAGNETIC**  
MANUFACTURING CO.

661 S. 28th St., Milwaukee 46, Wis.

## COAL MEN ON THE JOB



ELLIOT COAL MINING CO., Philipsburg, Pa.—John Frank (left), master mechanic, and Joseph Chadima, chief electrician, supervise the Oxcocle Mills cleaning plant.

With these advantages, it still was necessary to increase tons per man-shift, and it was believed that it could not be done with equipment then available. Investigation of the problem resulted in the conclusion that conveyor transportation with the bridge unit was the answer. The bridge, or "Piggyback" unit finally worked out in conjunction with the Long Super Mine Car Co., made transportation continuous and, consequently, increased loading time and unit output substantially.

Suspended at one end under a bob-tailed boom and with the other end resting on a wheeled dolly riding on a flanged room conveyor, the Piggyback unit, Mr. Crichton stated, is adaptable to all seam heights, has a capacity beyond all previous units, can be operated anywhere conventional loaders can be used, has maximum maneuverability, can load at an angle of 90 deg each way, can load 35 ft each way for crosscutting and permits driving rooms with crosscutting both ways on 70-ft centers. It eliminates many of the disadvantages of the independent machine when served by room conveyors, including time lost in positioning boom, spillage, tramming with coal, and so on. Also, it will operate nearer peak capacity where close timbering is required and is an inexpensive unit applicable to any standard crawler loader.

The standard crew is five men—loader operator and helper, cutter and helper and utility man. These men handle everything at the face. Drilling is done with flexible-shaft equipment powered from takeoffs on the shortwall cutters, and 8 to 10 3-in holes 8 ft deep for an entire face can be drilled in less than 5 min. Away from the face, and where shuttle cars are employed, shaking feeders are used, Mr. Crichton observed, to con-

# BAKER MINE EQUIPMENT...

... designed for improving efficiency of trackless underground mining



## BAKER MINE TRACTOR

For trackless hauling of trailers in seams as low as 30 inches. Pneumatic-tired, battery-powered. Pulls ten-ton pay load on pneumatic-tired trailers. Ideal for hauling coal, supplies, mine personnel, face equipment, timbers, etc. Smooth running, easy steering; Economical to operate and maintain. Carries U. S. Bureau of Mines permissible plate.

## BAKER TROLLEY TRACTOR

The ideal supplementary transportation unit for mines utilizing belt conveyors for main line haulage. Operates from trolley or battery—Battery is re-charged while tractor is on trolley thus providing constant operation with no time out. Eliminates charging stations and need for two types of equipment. Safe for hazardous areas when running on battery.

## BAKER TIMBERING MACHINE

Mechanizes erecting of timbers, making it a quick and safe job for a two-man crew. Machine hauls trailer with timbers, saws timbers and positions cross-bars, holding them against roof while posts are measured, sawed and placed. Battery-powered, pneumatic tired, with hydraulically-driven saw. Carries U. S. Bureau of Mines permissible plate.

## DRILLING AND BOLTING HEAD—attachment for Baker Timbering Machine

With this attachment *Roof Bolting* and *Timbering* can be done efficiently with one machine in mines where both types of roof support are used. Full hydraulic power and control provides constant pressure on drill feed and easy positioning with relation to roof or floor. Drill and torque wrench are combined in a single "V" type head.

## BAKER TRIKE—

Maneuverable, 3-wheel, battery-powered, pneumatic-tired unit for carrying mine personnel and hauling trailers loaded to one ton in very low coal. Driven from prone or sitting position. Overall height only 22 inches. Increases efficiency of low-seam mines by bringing key men and materials quickly to the spot where needed. Carries U. S. Bureau of Mines permissible plate.

## BAKER-FLETCHER ROOF DRILL AND WRENCH with hydraulic tram

Highly mobile and compact, self-tramming roof drilling and bolting machine. Operated hydraulically with electric power from drag cable. Hydraulic tilt of 45° either side for angle boring. Drilling speed to 10 FPM. Requires no skill. Fitted for water drilling. Explosion tested.

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**J. H. FLETCHER & CO.**

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Find out more about how West Virginia pre-fabricated track can save you money. Write today.



**STEEL TIES**—Standard design and weights. Save labor, save height, make good track.



**NOTICE**  
Due to material shortages and present heavy demand, prompt delivery is not always possible.



**RAILS**—In ASCE sections and any lengths, high quality rail steel for durability.



**SWITCH STANDS**—Tape in design, tops in service, tops in quality and variety.



**TURNOUTS**—Economical in use, economical in cost, easy to install and maintain.



**ROOF BOLTS**—The greatest forward step in safety and economy in mining in years.

**West Virginia Steel & Mfg. Co.**  
Huntington, West Virginia

Manufacturers of  
**RAILS and ACCESSORIES  
TRACK WORK  
STEEL TIES**

## COAL MEN ON THE JOB



PITTSBURGH COAL CO., Div of Pittsburgh Consolidation Coal Co., Renton, Pa.—C. M. Hays (left), mining engineer, Division No. 1, and H. P. Bogaty, chief draftsman.

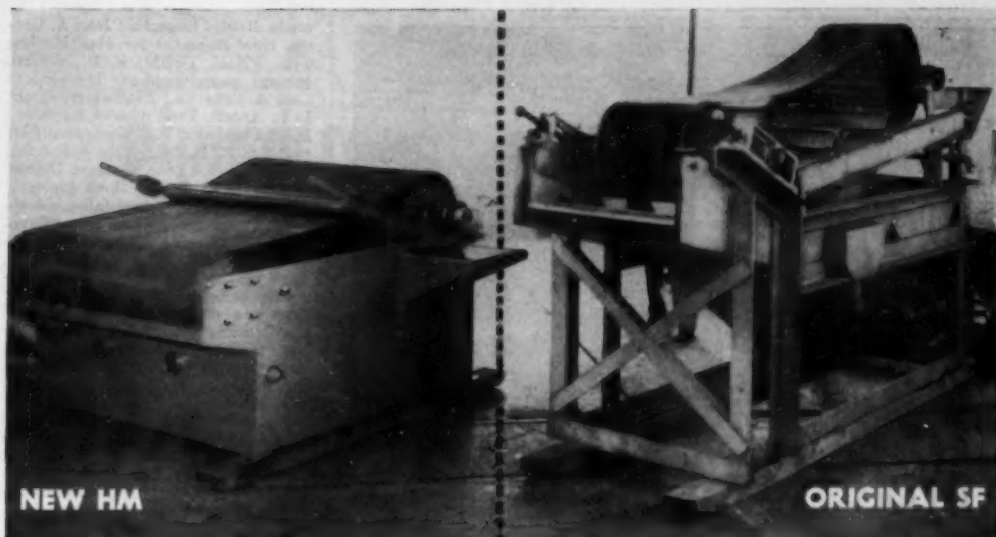
trol the flow of coal to the belts. This controlled flow is an important factor in all-belt operations.

Goals in Piggyback development were: (1) nearly continuous transportation, (2) development of a unit that could be handled by the machine operator, (3) ability to maneuver at all angles at maximum distance, (4) elimination of spillage, (5) minimum contamination of face product, (6) as high a percentage of plus ¾ as possible, (7) production with the lowest possible maintenance cost, (8) creation of a minimum of dust, (9) a face system with all the advantages of the previous system, and (10) highest possible tons per man.

Results cited by Mr. Crichton were as follows: a production in 11 mo of over 130,000 tons from one unit in 40-in coal at a face cost of 84½¢ per ton, including down time and moving; highest tons per faceman, 53, with a face cost of 53¢; June 1 report, 41 facemen, 1,065 tons, 25.9 tons per man, with a face cost of 71¢; peak in that period, 206 tons, five men, 45¢ face cost; best month, 4,313 tons, 174 man-shifts, 24.7 tons per man, 68¢ face cost, 40- to 41-in coal.

Average loading rate is 0.7 tons per minute per machine, and "our theory," said Mr. Crichton, is that it is better to have low tons per unit, few men and a high tonnage per man. In general, he continued, operators fail to get all out of the machines that is possible. His organization's attempt to correct the situation has resulted in an actual average loading time of over 50% of the shift, with 66% somewhat frequently and 85% occasionally. The operation is smooth and easy, the required regulation of coal flow is simplified and machine maintenance is sharply reduced.

With Lyman Fearn, chief inspector for Wyoming, as chairman, the safety panel included Finlay McCollum, Col-



**NEW HM**

**ORIGINAL SF**

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RECOVERS 99.8%, IS SMALLER, LIGHTER, COSTS LESS**

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### AIEE Paper on Heavy Media Process Available Free

Co-authored by K. A. Blind of Dings and J. J. Boon of American Cyanamid, this 9-pg. paper will be of considerable help to anyone interested in the potentials of the Heavy Media Process. Write:

**DINGS MAGNETIC SEPARATOR COMPANY**  
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# Dings Magnets

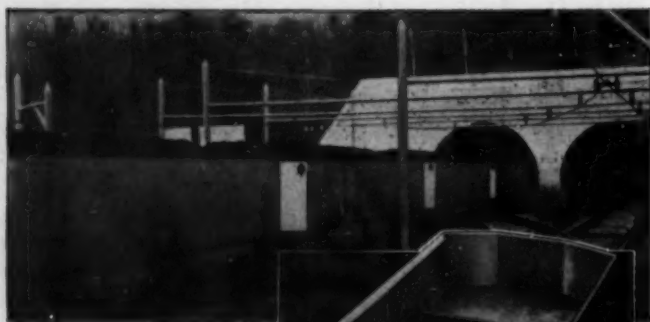
### IMPROVED FEATURES OF DINGS TYPE HM CROCKETT

1. Incorporates 6 magnet poles compared to 8. Purity of concentrate remains the same; recoveries are considerably improved.
2. New design permits lower cost.
3. Floor space reduced 53%; head room reduced 34 inches.
4. Magnetic intensity increased 15%.
5. New undershot feed arrangement provides greater medium recoveries.
6. Side overflows eliminated; this product now discharged adjacent to the tailings valve. No piping is needed.
7. Sealed self-aligning ball bearings on head and tail pulleys.
8. New self-adjusting belt tightener.
9. Integral tank and frame assembly permits standardization irrespective of head room requirements.

**DINGS SEPARATORS HAVE BORNE AMERICAN CYANAMID COMPANY'S APPROVAL FOR OVER 10 YEARS.**

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When we say "greater capacity" we mean just that. Within given length, width and height, you'll realize greater cubic footage in Differential Mine cars than in any other make. Differential's special, patented, AXLESS truck design is largely responsible. There are other important benefits, also, in this Differential feature — increased safety, less spillage, easier riding, etc.

When we say "greater earnings" we mean that, too!

Whether you think in terms of:

➤ **FEWER CARS REQUIRED** (therefore lower investment in equipment)

➤ **LESS MAINTENANCE** as a result of fewer cars needed and less spillage.

➤ **LOWER OPERATING COSTS** (greater ratio of payload to gross weight, higher speeds, etc.)

or any of several other factors affecting your operations, you'll enjoy greater earnings with these cars. Send now for Mine Car Folder, D-53.

Differential Products Include: Locomotives, mine cars, mine supply cars, rock ladders, mantrip cars, air dump cars, dumping devices and complete haulage systems.

# **DIFFERENTIAL** STEEL CAR COMPANY

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SINCE 1915 — PIONEERS IN HAULAGE EQUIPMENT



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FLEXIPIPE: Reg. U.S. Pat. Off.

orado district inspector; John A. Garcia, chief inspector for New Mexico; Tom O'Neal, USBM; E. O. Jackson, general superintendent, Independent Coal & Coke Co., Kenilworth, Utah; L. L. Arnett, Utah district inspector; H. O. Lindeman, U. S. Geological Survey; and R. H. Dalrymple, Salt Lake, plus volunteers from the floor. Discussion centered around three topics:

1. How to reduce roof-fall accidents — Recommendations included enforcement of timbering agreements, better selection and training of supervisors, more education of miners and supervisors, and roof bolting. Rib-bolting also was cited as having excellent possibilities, with friability as perhaps the determining factor in bolting in coal.

2. Infusion of pillars with water as a means of reducing dust — Work at the Kenilworth mine was briefed by Mr. Jackson, who stated that it was doing a pretty good job of cutting dust and preventing heating and firing of coal pillars. Definite possibilities were cited by others participating.

3. How to reduce haulage accidents — Recommendations were education of men to eliminate chance-taking, good track and equipment, proper lighting, sensible operating speeds, and care of links, pins and hitchings.

## Mine Inspectors' Meet Studies Better Safety

**Begins on p 140**

Management is responsible for those accidents that grow out of defective equipment and unsafe, inefficient job standards, Mr. Campbell stated. Employees, on the other hand, are responsible for accidents growing out of human failure. However, when employees fail to handle equipment properly or when management permits unsafe practices to continue, responsibility shifts from one to the other. That is why sincere cooperation is essential to safety, he concluded.

Safety education should begin wherever accidents are likely to occur, said Emery C. Olsen, supervisor of safety, Geneva Steel Co., Draper, Utah. This means that safety training should be started at home among children, who thus would become safety conscious early in life. This training should be continued through the school years, especially in mining districts. However, since few parents know how to train children for safety and few states provide safety courses in school systems, the main burden at present must fall on industry. Assuming this obligation, Geneva Steel Co. encourages off-the-job safety training as a civic responsibility and cooperates with any group or organization that requests such training. In the last 7 yr, the company has shown safety films, staged safety demonstrations and given



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**cost more**  
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by using Dependable Quality  
**CRANE VALVES**

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more Crane Valves  
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easy access prevents trouble with this valve

Remove just two nuts to dismantle this gate valve for inspection, cleaning, or repairs—without taking it from the line. Reassemble just as easily, knowing that Crane clamp design keeps the bonnet joint snug and accurately aligned. Use Crane Clamp Gates on steam, water, and air, but especially in heavy fluid lines needing periodic cleanout. They'll save time, labor, and encourage regular servicing that prevents valve trouble.

Combining easy access with highly dependable service features, Crane Clamp Gates typify Crane Quality—better valve performance at lowest ultimate cost.

No. 488 Iron Body Clamp Gate

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## how to save time, labor, money in **STRIP MINING**

**Acker TEREDO Core Drills accurately measure depth of overburden thickness and quality of coal seams**

The Acker Teredo core drill will tell you quickly, inexpensively, positively the exact condition of coal seams up to depths of 600 ft.

Sturdy enough to withstand the most rugged conditions, yet light enough to be portable, the Teredo can be mounted on truck, trailer, jeep or skid.

In bituminous fields, the Teredo can operate the specially designed double tube core barrel which will retrieve accurate samples, even where others have failed.

Write today for information and Bulletin 4C-CA.

**ACKER DRILL COMPANY Inc., Scranton 3, Penna.**

## CABLE WEAR PROBLEMS



Now you can strengthen your cable so that it can be dragged *anywhere* with complete safety. Ruberoid Insulating Tape does more than just "patch" a cable splice; equally adhesive on *both* sides, it has an inter-bonded grip that holds the spliced cable with vise-like power. It's no wonder that Ruberoid Insulating Tape has led in the cable-maintenance field for more than half a century!

### Check these Cost-Cutting Features!

- |   |  |
|---|--|
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**Mine Inspectors' Institute . . .** safety training to 20,000 people outside the company.

A company program should provide for careful selection and intelligent placement of new workers, Mr. Olsen explained. This should be followed by courses in a training school or by informal but nonetheless painstaking instruction, including job methods, first aid and safety regulations. All workers, new and old, should be urged to attend regular safety meetings. Job training should be open to new workers to provide them with experience and to old workers to give them a chance to advance.

The training school is the logical substitute for apprentice training, which has disappeared in mining, Mr. Olsen said. Benefits to be derived from a school could offset training costs, which would average about \$200 per man. Training should be given on the surface and underground, with underground schooling being given in a special training section of the mine. Advanced courses in this school should be set up to help workers who seek promotion to supervisory jobs. Materials for safety training to accompany job training are available from National Safety Council, the U. S. Bureau of Mines, state educational agencies and, in the case of Geneva Steel Co., the Safety Advisory Committee, U. S. Steel Co.

Geneva Steel aims much of its safety effort toward supervisors, schooling them in methods, policy and procedure and training them in the art of handling men. They are told that prevention of accidents is as much an index of ability as the production record and they are reassured continuously of the company's full backing. This training program cannot be completed in a few weeks or months but must continue for years, Mr. Olsen said.

Gas in dangerous quantities will accumulate in gob areas in mines where it will not accumulate to a dangerous degree elsewhere, said John H. Hansford, director of mine rescue, West Virginia Department of Mines, Charleston. This was one of the conclusions that followed study of an explosion that took the lives of 11 men at the Burning Springs mine, Kermit, W. Va., Jan. 18, 1951. Methane had not been detected in this mine for 2 yr, ventilation was adequate and foremen with safety lamps examined the faces before and after shooting and before cutting. Gas apparently entered the mine after a crew broke through to a recently abandoned area in which final robbing had been completed. The old workings were on the intake side of the section but had been pillared and could not be examined. The gas apparently moved into the new section in a body and was ignited by a worker's smoking, the investigation indicated. Pointing up the lessons to be learned from this explosion, Mr. Hansford warned as follows:

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1. Generally, places should not be driven into the gob when the gob is on the intake side of the air current.

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3. Gas in dangerous quantities will accumulate in gob areas.

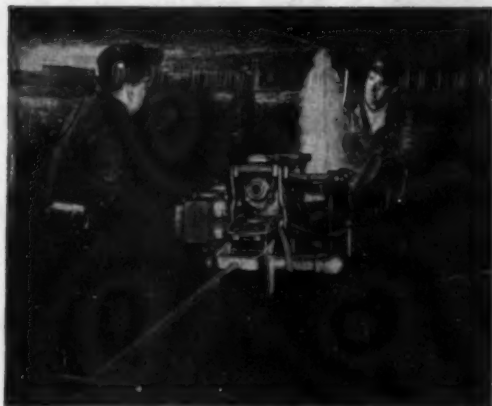
4. Any mine in which methane and air will build up to firedamp proportions is a hazardous mine even though firedamp may be found only in minute quantities.

5. If it is possible to find firedamp in a mine, that mine should be classified dangerous.

Roof-bolting is the latest development to ease the most difficult problem in mine safety, said Joseph Bierer, administrative assistant, West Virginia Department of Mines, Charleston, W. Va. Mr. Bierer spoke at the Tuesday morning session, Mr. Deike presiding.

Sixty percent of all roof-bolting has been done in West Virginia, Mr. Bierer said. In his state's 22 seams, 227 permits have been issued to 154 mines for roof-bolting installation or experiment. Citing the records, he said that to Jan. 1, 1951, 3,542,131 bolts had been used to bolt 2,870,552 ft of entries and 359,216 ft of rooms. Bolts range from 12 to 96 in in length. In 81% of the permits, wedge-type bolts 1 in in diameter are specified. In 88% of the installations, either 8x8x $\frac{1}{2}$ - or 6x6x $\frac{1}{2}$ -in plates are used. In the remainder, other plates, wooden crossbeams, half headers, steel chan-

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### Mine Inspectors' Institute . . .

nels and flat bars are used. Mechanical-loading mines have 24% of the installations; conveyor mines, 5%; mechanical-loading-and-conveyor mines, 17%; mines combining hand loading with other methods, 50%; hand-loading mines, 4%. Only 8 of 122 roof falls reported in bolted areas occurred in the face regions. Only 51 out of 171 mines reported falls of bolted roof and only 24 reported personal injuries.

Between 1948, when roof-bolting first started, and 1950, tons of coal produced per non-fatal accident increased from 38,143 to 44,532; tons per fatal accident, from 1,062,702 to 1,706,756. There have been four fatalities as a result of falls of bolted roof, but only one of these occurred where roof was bolted according to permissible standards.

Though some problems still remain—how to obtain uniform, reliable anchorage and how to offset the element of time, which seems to be responsible for failures that occur in entries—benefits of roof-bolting are real, Mr. Bierer said. These benefits include recovery of coal hitherto thought unminable, conservation of natural resources and a growing spirit of cooperation between miners and managers.

More roof bolts are installed in Alabama iron mines than in the state's coal mines, explained Mr. Harper, new institute vice president who presented the second paper Tuesday morning. The reasons for this are: (1) prior availability of compressed air in iron-mine working places; (2) prior availability of rock-drilling equipment in iron mines; and (3) the availability of steel to the steel companies, which operate all the large ore mines.

First coal-mine installations of roof bolts in Alabama were made at the Concord mine, Tennessee Coal, Iron & R.R. Co., when that mine was under development in May, 1948. Roof-bolting now is used exclusively in the Concord mine, the bolts holding roof that no other system would support. To March 1, 1951, T.C.I. had used 670,903 bolts in 8,506,528 sq ft of roof. At another mine, 24-in bolts are being used successfully in a 33-in seam with rooms 42 ft wide. Percussion drills are used in all these installations.

In both ore and coal mines in Alabama, most drilling is done wet, though some is done with dust collectors. Some bolting is done with 3/4-in rods and expansion-bolt shells. Mostly, though, bolts are 1 in in diameter, of various lengths to fit local needs, and are of low-carbon steel with 6-in threads and 6-in slots. Bolts are spaced on 4- and 5-ft centers. Channels are used in very bad top but mostly 6x6x3/4-in plates are used in coal, larger plates in ore. Bolts are driven up on wedges for 10 sec and are tested periodically for tension and torque. Stoper drills with feed legs

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### Mine Inspectors' Institute . . .

are used in most drilling and for driving the bolt onto the wedge.

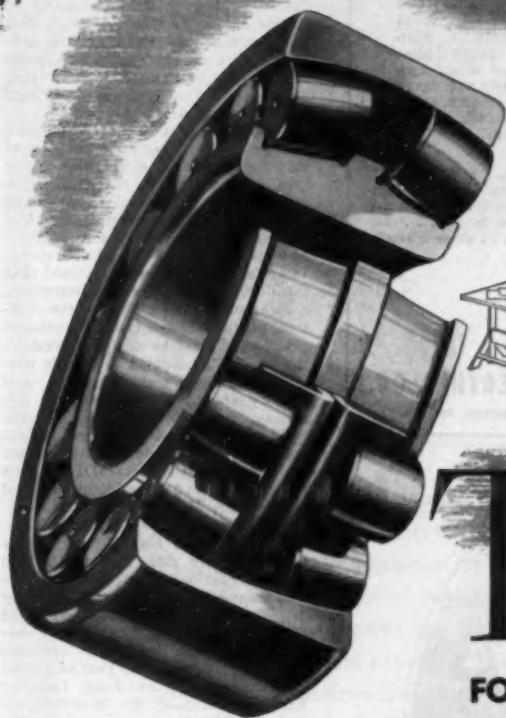
None of Alabama's seven rock-fall fatalities in 1950 was chargeable to roof-bolt failure. In addition to increased safety, other benefits of roof-bolting are as follows, Mr. Harper said: (1) reduction in handling of bulky timbering materials; (2) better housekeeping; (3) more room in working places; and (4) increased maneuverability of mobile equipment.

But not all the questions have yet been answered, Mr. Harper contended. Needs still to be filled include the following: (1) standardization of equipment for roof-bolting; (2) equipment better adapted to the job; (3) better dust control; (4) better information about depth, spacing and size of hole; and (5) a more thorough knowledge of local geology.

Roof bolts have been installed within the last 2 yr in 23 Illinois mines to secure about 11 mi of entries and 12,000,000 sq ft of mine roof, reported William J. Johnson, assistant director, Illinois Department of Mines & Minerals, Springfield. Citing the achievements of the men who introduced coal-mine roof-bolting at properties of The Consolidated Coal Co., Johnston City, Ill., Mr. Johnson traced development of methods and equipment since that time. Home-made and factory-built machines now are in use that will drill from 50 to 100 or more holes per day up to  $5\frac{1}{4}$  ft deep. In one mine in southern Illinois where roof bolts new are used, production has increased as much as 50 to 70 "buggies" per day. Both wedge and expansion bolts are used and nuts are tightened to 150 lb against 3x18x8-in wooden blocks that are placed between the steel plate and the roof. Though the roof is extremely bad, this mine has had no compensable accidents in the past year and no fatalities for 2 yr.

Even so, Mr. Johnson said, successful roof-bolting requires careful supervision. The Illinois Department of Mines & Minerals has recommended that all mines undertaking roof-bolting experimentally use conventional timbering simultaneously until it is clear that bolts will support the roof. The department urges that wedge-type bolts be at least 1 in in diameter and that expansion-shell bolts be at least  $\frac{3}{4}$  in in diameter.

Drilling for roof-bolting has created a new dust problem for coal mining, said James Westfield, chief, Accident Prevention & Health Division, District VIII, U.S. Bureau of Mines, Pittsburgh, Pa. The problem is more acute because roof drilling produces a dust with greater quantities of free silica. Quartz is present in significant quantities in about 91% of all the rock drilled for roof-bolting. Free-silica content of dust samples from 51 mines in 9 eastern states averaged 31% and ranged from 7 to 88%. Mines having shale roof produced



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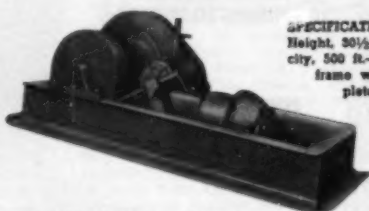
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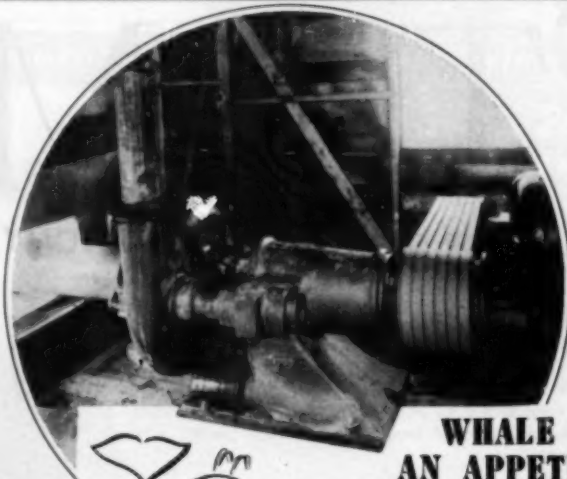
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## Mine Inspectors' Institute . . .

samples averaging 26 1/2% free-silica content, with ranges from 7 to 62%; mines with sandstone roof, an average of 55% with ranges from 31 to 88%.

In spite of these conditions, solution of the dust problem has lagged behind other roof-bolting developments. At 71% of 353 mines examined in Region VIII where roof is bolted, no dust-control equipment is used. Among the 102 mines that do use dust-control methods, a majority of 10 use dust collectors. Although data indicate that pneumatic drilling produces twice as much dust as electric rotary drilling, either method may produce dust that is dangerously high in silica content.

Successful wet drilling depends upon maintaining an adequate flow of water through the drill, using water continuously through the drilling period—even during collaring—and providing positive ventilation. The Bureau now has under way a series of tests of six dust-collecting systems. Thus far it has been determined that the design of the hood, exhaust ventilation must be adequate, restrictions must be avoided to permit passage of large scaly particles, and gravity should be used to full advantage in moving cuttings from the hole. In over-all design, size, weight and portability of dust collectors are important. Dust collectors, it has been found, give more effective control than water, Mr. Westfield said.

The Federal Mine Safety Code requires water to control dust where roof or other rock is being drilled with percussion drills. The result is that some operators successfully using dry dust collectors have been cited for code violations. The Bureau recognizes the position of an operator thus cited and suggests that he appeal the citation to the Joint Industry Safety Committee, Mr. Westfield explained. The Bureau already has asked the committee to revise the code to permit use of dry dust collectors.

Discussion of Mr. Westfield's paper by Paul Chikos, Eastern Gas & Fuel Associates, and Earl Maize, Safety Division, National Coal Association, brought out the following: (1) roof-bolting can be done in 3-ft coal, even where 5 to 6 ft of weak strata lie above the coal, but it is costly and difficult, involving bolting at an angle and possible use of extensions; (2) USBM standards now used to limit free-silica content of air are tentative, being based on state findings, and the computations involved, if they err at all, err on the side of safety; and (3) since rotary drilling, like percussion drilling, produces dust, there is no valid reason why an operator should be cited for using a percussion drill and the Federal Mine Safety Code should be revised accordingly.

Further discussion involved J. J.

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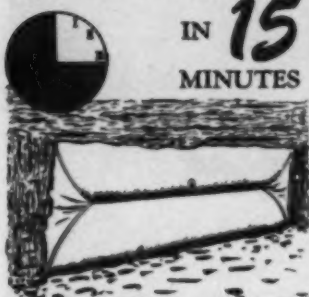
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## Mine Inspectors' Institute . . .

Forbes, chief, Safety & Health Div., USBM; P. M. Budzak, American Reinsurance Corp.; and Mr. Bierer. Mr. Forbes made a plea for a meeting of minds on the Federal Mine Safety Code, urged careful investigation of roof strata before going ahead with roof-bolting, and warned that fatalities now are running at an annual rate of about 800 per year, somewhat higher than in 1950.

Mr. Bierer, replying to a question by Mr. Budzak as to the ability of bolts to hold roof for extended periods of time, pointed out that although there has been no detailed investigation of disintegration in the drillhole itself, time clearly is a factor in roof-bolt failures and water may be a factor also. However, with bolting there often is enough warning of probable roof failure—say, 2 wk—to take protective measures. Some bolts have served well for 2 to 4 yr, he pointed out.

Roof-fall fatalities are more likely to occur at the face than anywhere else, said H. F. Weaver, assistant chief, Coal Mine Inspection Branch, USBM. Mr. Weaver led off at the Wednesday morning session, Mr. Alexander presiding. His paper, a summary of USBM Information Circular 7605, titled "Falls of Roof: The No. 1 Killer in Bituminous Coal Mines," is adapted and published in *The Foreman's Forum* in this issue of *Coal Age*, p. 100.

The key to modern roof support is correct mental alertness, said J. J. Plasky, training and safety director, Red Jacket Coal Corp., Red Jacket, W. Va. Timbering standards approved by all concerned are in effect at each of the company's mines and no deviations are permitted except by written permission of the chief engineer and the safety director. Changes in the standards themselves require the recommendation of the general mine foreman and the superintendent and the approval of the chief engineer, safety director, general manager and assistant general manager.

Even with these safeguards and standards, however, the company still relies primarily on worker and supervisory attitudes. The result of rigid standards and proper attitude has been a 75% reduction in roof-fall accidents in the last 5 yr, with one mine employing over 600 men having had only four lost-time accidents in 3 yr. The big task is to create the correct mental reaction habitually and instinctively. This is being done by safety training which, through psychology, is the modern approach to safety. "Adequate training geared to develop the proper attitude is the key to modern roof support," Mr. Plasky concluded.

"Roof support at the working faces follows a regular conventional pattern of timbering," said Arthur Bradbury, safety director, Inland Steel Co.,



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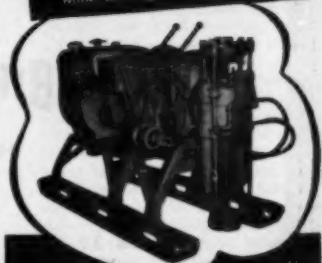
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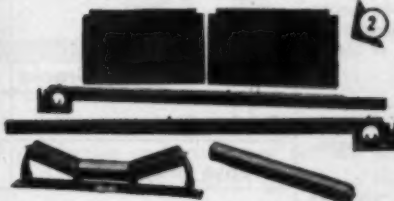
**DESIGN FEATURES:**



Typical CONTINENTAL underground Belt Conveyor installation.

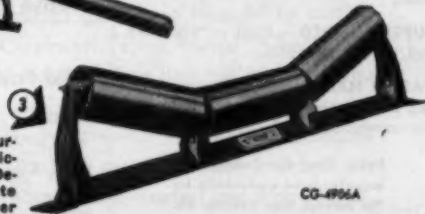


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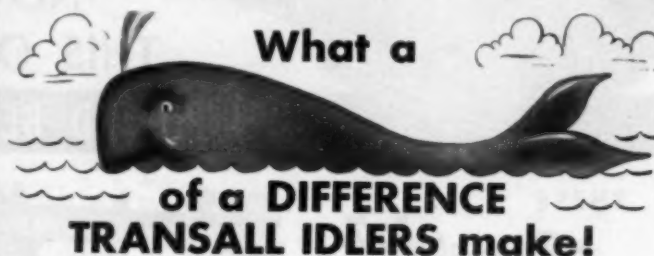
## **Mine Inspectors' Institute . . .**

Inc., Wheelwright, Ky., in describing safety practices at his company's mines. With coal averaging 45 in. in thickness and ranging from 34 to 50 in and with immediate roof often being over 5 ft thick and weakened by moisture, roof bolts are not extensively used, he explained.

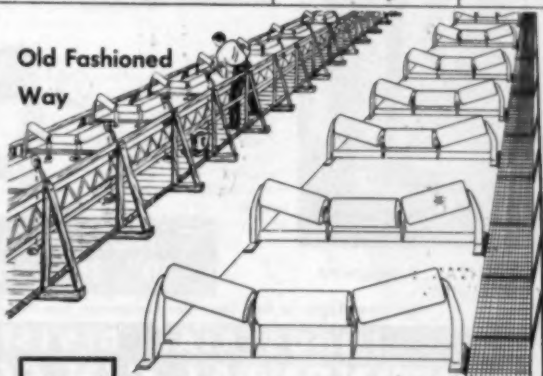
A successful roof-safety program depends upon organization and education for safety supported by adequate supervision and strict enforcement of safety rules and timbering standards, Mr. Bradbury said. Timbering standards are geared to the various roof conditions encountered.

Posts, jacks, steel beams and wooden crossbars are used extensively.

The promotion of safety consciousness among workers is the aim of all safety education and special stress is laid on roof hazards. The dangers are emphasized at regular monthly meetings of staff and supervisors and at meetings held on each mine section monthly and, in some instances, more often. General safety meetings are staged monthly in the local theater, Mr. Bradbury added. Foremen are required to discuss some safety rule or practice with one of their workers every day. A public-address system carries safety messages to workers while they await the mantrip and



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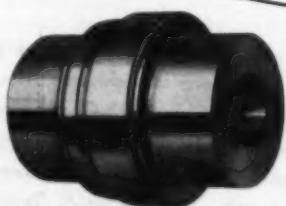
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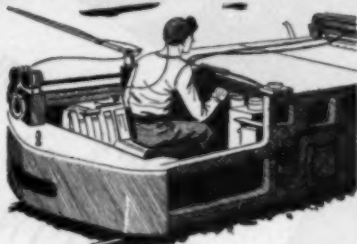
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## Mine Inspectors' Institute . . .

posters and special messages are displayed on bulletin boards. All supervisors have completed one USBM safety course and classes now are being held for another course.

Concentration of work in a few places makes close supervision possible, Mr. Bradbury said. Every section on each shift is inspected at least once a month and often more frequently, with special attention to face timbering. Assistant foremen are given a monthly safety rating. In areas where kettlebottoms occur, they are carefully sought out and pulled down or drilled and shot down. Mr. Bradbury explained how he had used one kettlebottom as an effective safety display at the mine mouth.

Experimental roof-bolting is permitted in Pennsylvania provided certification is issued, said J. V. McKenna, inspector, Department of Mines, Waynesburg, Pa. Even so, standard, conventional timbering must supplement roof-bolting until it can be proved generally that bolting alone will provide as much safety as timbering. Operators have found the double cost of timbering and bolting justified in that they do not have to clean up and retimber intersections on retreat. Most bolting failures have occurred where there is no roof structure and no parallel lamination and where the roof is wet.

Experience shows that precautions must be carefully observed in roof-bolting, Mr. McKenna said. Temporary protection must be provided while drilling is under way and the bolts are being installed. Dust must be controlled by water or dust collectors. Although roof-bolting has not yet reached the point where it can be relied upon exclusively to support roof and provide safety for workers, the industry is making progress and the time may come when roof-bolting can take over entirely, he concluded.

Mining four seams of coal presents various problems at mines of Stonewall Coke & Coal Co., Big Stone Gap, Va., said T. J. Liddle, safety inspector for that company. The Imboden seam, which has a fragile roof, requires close timbering. Face timbering in this seam consists of cross-collars on 4-ft centers and one or more safety props at the face. A sprag set in the cut between the top and bottom benches of coal protects workers against breaks in the top coal. Brushing roof along main haulage lines eliminates the need for timbering.

In the High Splint seam, where mobile loaders are used, the sandstone roof requires little timbering. Company standards call for cross-collars with steel jacks at the face and for props near and on each side of all hill seams or surface breaks.

In the Taggart seam, roof bolts are used in addition to timbers in some haulageways. In areas where the two methods are used together, it has not been necessary to replace cross-col-

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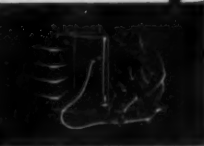
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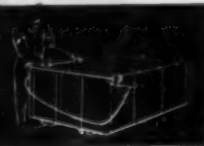
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## Mine Inspectors' Institute . . .

lars, which often break unless supplemented by bolts.

In the Marker seam, with roof varying from massive sandstone to fragile shale, several plans of mining and timbering have been tried. The present system is to drive rooms 21 ft wide on 67-ft centers to a depth of 500 ft, leaving a 46-ft pillar to recover. The rooms are advanced with props on 4-ft centers and cribs are built along the belt line, providing a safe travelway and protecting the belt line. In recovering the pillar, the wide face is supported by timbers on 4-ft centers and by 13 cribs, the cribs being arranged in two rows and staggered between the face and the gob area. After a cut of coal has been loaded and another cut put in across the face, the conveyor is advanced and the row of cribs nearest the gob is taken down and moved up close to the face conveyor. Cover in this seam is about 2,200 ft. There has been no compensable injury in this mine since 1948, Mr. Liddle added.

The present national emergency demands the best possible service from the coal industry, said Richard Maize, secretary, Department of Mines, Harrisburg, Pa. To perform this service, miners, operators, and state and federal inspectors must work together in the national interest.

Miners can help as follows, Mr. Maize said: (1) by working safely to guard against loss of working time; (2) by carrying out the terms of the wage contract; (3) by working to make up production lost by absence of men in uniform; (4) by reporting for work regularly; and (5) by cooperating with operators in improvement of coal quality and output.

Operators can help by: (1) protecting workers from unnecessary hazards; (2) establishing mutual confidence with workers by granting their just demands; (3) observing the law and thus protecting liberty; (4) providing and enforcing safety standards; and (5) increasing the supervisory force and improving its efficiency.

State mine inspectors can help by: (1) observing and enforcing all laws enacted for the miners' welfare; (2) making careful and detailed inspections to safeguard workers pressed by the need for faster production; and (3) aiding operators and miners in their tasks and thus helping the men fighting on battle fronts.

Federal inspectors can help by: (1) continuing the federal safety program; (2) avoiding conflict with state laws; and (3) collaborating with recognized authorities in the safety movement in drawing up rules and regulations.

"To firmly establish and attain our end will require the spirit of making allowances, of yielding a point here and there and of enduring inconveniences for our mutual benefit and for the common good," Mr. Maize concluded.



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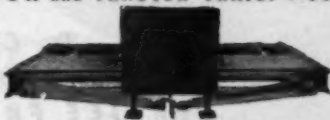
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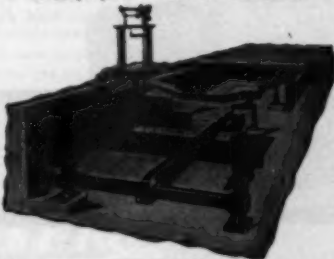
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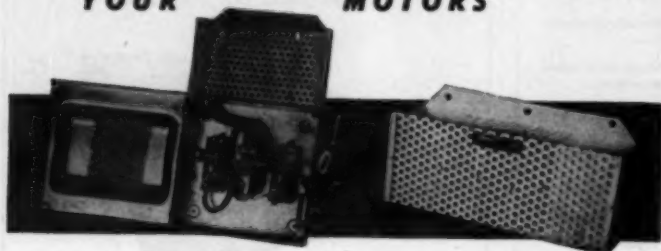
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For Main Hoistage • Prevent Collisions  
Save Trip Time

A two wire cable connects two or more signals together into one block. Only one signal can show proceed on the entrance of a trip, all other signals show stop.

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MINE MASTER Mechanic and Chief Electrician with responsible experience in mechanized coal mining wanted to supervise installation and maintenance of underground mechanical and electrical equipment of large, highly mechanized, potash operation. Also Plant Master Mechanic and Chief Electrician wanted for same operation to supervise machine shop and maintenance of mill and refinery mechanical and electrical surface equipment. Salary open. Location: Southwest. P 1135, Coal Age.

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POSITION As Master Mechanic, chief electrician or shop foreman, over twenty years practical experience. PW 9892, Coal Age.

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ANYTHING within reason that is wanted in the field served by Coal Age can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

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Salaries Position, \$4,000 to \$36,000. This Confidential service for men who desire a new association, will develop and conduct preliminary negotiations without risk to present position. Send name and address for details.

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CHEAP PROCESS PREPARES  
COAL FOR SPECIAL MARKETS

Write Records Ind. Res. Lab.  
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Move west with decentralization to the future synthetic fuels area. Have approx. 80 feet bituminous coal in 3 seams. Mine now operating. Shipping point, Craig, Colo. Brokers invited.

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Craig, Colo.

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NEW — ALUMINUM

35" wide x 6'-7"-8'-9"-10'-11'-12"  
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FAHrion 1-4950

## FOR SALE OR RENT

1 Model 1055 LC P & H Dragline SN 12962; new 1948. Completely overhauled. A-1 condition.

USONA CONSTRUCTION CO.  
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## FOR SALE

## MOTOR GENERATOR SETS

- 1—300 KW General Electric synchronous Motor Generator Set, AC and 450 HP, 2300 volts, type TS, 1200 RPM. Direct connected to type MPC, 300 KW, 1200 RPM, 250/275 DC volts generator, complete with fully automatic switchboard.
- 1—150 KW General Electric Motor Generator Set type CD 123, form A, comp. wound, 557 amps, 250 volts no load, 275 volts full load, 1200 RPM. Cont. 40 degree cent.
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## MINING MACHINES

- 4—512 Goodman AC Shortwall Mining Machine. Two of these machines complete with Joy Cat trucks.
- 3—Sullivans CLE2 Longwall Mining Machine, 3/60/220 volts, form B, Class AE 660, controller 11089-KL, 4 1/2" cutter bar, complete with cables.
- 1—15A Goodman 50 HP Standard Mining Machine, 42" gauge, AC.
- 1—112AA Goodman Universal Mining Machine, AC.

## CRUSHERS

- 1—36 x 60 Link Belt double roll crusher
- 1—24 x 48 McNally Pittsburgh double roll crusher
- 1—18 x 18 Jeffrey single roll crusher
- 1—24 x 24 Jeffrey single roll crusher
- 1—30 x 36 United Iron Works single roll crusher
- 1—24 x 24 Hercules single roll crusher
- 1—48" McNally Pittsburgh Vertical Pink Breaker
- 1—American Pulverizer Company Ring Roll crushers

## COPPER CABLE

Several thousand feet No. 8 Three Conductor, 2300 volt, lead covered, armored cable, On reels and in lengths of from 500 to 1,000 feet.

## HOISTS

- 1—Ottumwa Iron Works conical drum hoist, serial #3168, weight 36,000#, 1 1/4" rope. Complete with remote control and hydraulic brake. Direct connected to G. E. 300 HP motor, model #32647, type ITC-5017, form M, 3/60/2200 volts, 170 RPM, 72 1/2 amps, 570 secondary amps, complete with automatic switchboard.
- 1—Hydraulic clutch type endless car haul machine, serial number 19640. Extra heavy type manufactured by Robbins Engineers, Inc. Normal rating 10004# at 61 FPM, maximum rating 27,500# approx. at 40 FPM. Fluid coupling feed for maximum torque of 585 ft. or 27,500 rope pull, 3/4" wire rope. Complete with 30 HP G. E. motor, model 5KR444, serial #2489674, 3/60/440 volt, totally enclosed.

- 1—Double drum American Hoist and Derrick Co. hoist, type 2/D, Serial number 1771. Drum diameter 18", face 28", flange 8", complete with 100 HP G. E. slip ring motor #4841605, type MDC3440 - 5 - 100 - 900, Form B, 440 volt, 3 phase, 60 cycle, secondary volts 270, speed full load 860. Model #12 E 924.

- 1—Sullivan type CHD Car Puller with 10 HP, 230 volt DC motor. Complete with type RP 3/4 HP electric rope puller, serial number 15670.

## FANS AND BLOWERS

- 1—Jeffrey Aerodyne Fan 5' diameter, with 7 V-belts, rated for a maximum of 80,000 CFM at 8 1/2" W.G. at maximum efficiency or a larger volume of air at a lower pressure and lower efficiency.
- 1—Jeffrey Aerodyne Junior Fan 3' diameter, single stage.
- 1—Lot of Jeffrey Blowers for 12" tubing—with ball bearing enclosed motors.

## DRILLS

- 9—Dooley #473 Electric drills 250 volts DC.
- 9—Dooley #473 Electric drills 250 volts DC.

## PIT CAR TRUCKS

- 150—Sets 42" gauge, 14" wheels, Timken bearing pit car trucks with American Car & Foundry and Sanford Day wheels.

## HOPPER CARS

- 29—15 ton Sanford Day automatic drop bottom cars with multiple latch arch bar truck, 4 wheels under each end, 18" wheels, 30" gauge, Sanford Day roller bearing trucks. Overall dimensions: Overall length over bumpers 25'2"; Overall length inside 20' 11 1/2"; Overall width 6'10 1/2"; Overall height 6'0". Size of door: Width 2'3". Length both doors 11'3 1/2".

GAVENDA BROTHERS, Inc.  
CANTON, ILLINOIS

- 2—4JCM Joy Continuous Miners, 250 Volt DC, practically new.
- 1—14BU Joy Loading Machine, re-built.
- 3—8BU Joy Loading Machines, 250 Volt.
- 1—52B Jeffrey 30" Belt Conveyor, 1500', 25 HP DC Drive.
- 1—18 x 18 single roll crusher, re-built.
- 1—30 x 42" McLanahan & Stone coal crusher.
- We have 35B and 29U coal cutting machines and locomotives.

## TIPPINS MACHINERY CO.

Pittsburgh 6, Penna.

## MOTOR GENERATORS

- 2—300 KW G.E. Syn. 275 V. 1200 RPM
- 1—200 KW G.E. Syn. 275 V. 1200 RPM
- 1—200 KW G.E. Syn. 275 V. 1200 RPM
- 2—150 KW G.E. Syn. 275 V. 1200 RPM
- 1—100 KW G.E. Syn. 275 V. 900 RPM

## ROTARY CONVERTERS

- 1—500 KW G.E. Syn. 275 V. 1200 RPM HCC, 6 Ph., 60 Cy. Transformers
- 1—300 KW G.E. Syn. 275 V. 1200 RPM HCC, 6 Ph., 60 Cy. Transformers
- 1—300 KW WEST. Syn. 275 V. 1200 RPM 6 Ph., 60 Cy. Transformers
- 1—200 KW WEST. Syn. 275 V. 1200 RPM 6 Ph., 60 Cy. Transformers
- 1—150 KW G.E. Syn. 275 V. 1200 RPM HCC, 6 Ph., 60 Cy. Transformers
- 1—150 KW WEST. Syn. 275 V. 1200 RPM 6 Ph., 60 Cy. Transformers

## ARMATURES

- 1—500 KW G.E. 275 V. MPC Gen. 900 RPM
- 1—300 KW G.E. 275 V. HCC Conv. 1200 RPM

## WALLACE E. KIRK COMPANY

501 GRANT BUILDING

PITTSBURGH 19, PENNSYLVANIA

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- 3—20 T JEFFREY 250 V. MH-77 48-36" Ga.
- 1—25 T G.E. 500/250 V. MH-824-A 44-36" Ga.
- 1—20 T JEFFREY 250 V. MH-77 48-36" Ga.
- 1—20 T G.E. 250 V. (random) MH-809 36" Ga.
- 1—13 T JEFFREY 250 V. MH-2110 42" Ga.
- 1—13 T GOODMAN 250 V. 136-B 36" Ga.
- 1—10 T JEFFREY 250 V. MH-2110 48-36" Ga.
- 2—10 T JEFFREY 250 V. MH-110 44-36" Ga.
- 2—10 T GOODMAN 250 V. 36-B 36" Ga.
- 2—8 T JEFFREY 250 V. MH-100 42-36" Ga.
- 1—8 T WEST. 250 V. ML-904-C 44-36" Ga.
- 2—4 T JEFFREY 250 V. MH-88 44-36" Ga.
- 2—4 T WEST. 250 V. ML-901-L 24" Ga.
- 2—4 T GOODMAN 250 V. MS-4-E 36-34" Ga.

## LOCOMOTIVE MOTORS

- 2—JEFFREY 250 V. MH-77, Ball Bearing
- 2—WEST. 250 V. ML-908-C, Ball Bearing
- 2—WEST. 250 V. ML-904-C, Ball Bearing
- 2—WEST. 250 V. ML-904-E, Ball Bearing
- 1—WEST. 250 V. ML-901-C, Ball Bearing
- 2—G.E. 500/250 V. MH-824-A, Ball Bearing
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33 New 10,000, 15,000 & 20,000  
Gal. Cap. Welded Underwriters Label.  
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Switchboards & Control Apparatus  
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Belt, Bucket, Drag or Gravity  
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- 1—42 inch—85 ft. long
- 4—36 inch—175 - 250 & 310 ft.
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- 15—24 inch—300 - 200 - 170 & 135 ft.
- 13—18 inch—340 - 225 - 150 & 77 ft.
- Each Conveyor has Belts, Motors, Drives, Terminals & Idlers. Excellent Condition.
- Also Surplus Belts — Idlers — Terminals.

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## SEARCHLIGHT SECTION

### ELECTRIC HOISTS

2—Kordberg 500 HP Slope Hoists  
1—Olinco 200 HP Slope Hoist  
General 150, 200 and 300 HP Single and Double  
Drum Hoists  
Complete specifications on request.

### LOCOMOTIVES, 250 VOLT DC, BALLBEARING MOTORS

3—20-ton Jeffrey, Type MM-77  
1—15-ton Jeffrey, Type MM-119  
1—10-ton General Electric, Type MM-220  
1—10-ton Westinghouse, Type 917-C  
1—10-ton Westinghouse, Type 907-C  
1—10-ton General Electric, Type MM-219  
1—10-ton Westinghouse, Type 905-C  
1—10-ton Goodman, Type 22A147  
1—10-ton General Electric, Type MM-201  
1—10-ton General Electric, Type MM-201  
1—10-ton General Electric, Type MM-201  
1—10-ton Jeffrey, Type MM-68  
1—10-ton Goodman, Type 208

### LOADING MACHINES, 250 VOLT DC

12—8-BU Joy; 3—11-BU Joy; 5—14-BU Joy  
5—L-600 Jeffrey; 5—L-500 Jeffrey; 4—L-400 Jeffrey  
4—202; 2—402; 4—200 Goodman  
4—No. 3 Myers-Walker, two years old

### CUTTING MACHINES, 250 VOLT DC

4—20-U Jeffrey, 5—7-AU Joy, almost new  
Three years old 3—25-B Jeffrey  
3—29-LE Jeffrey 3—33-BB Jeffrey  
14—12-AA Goodman 3—12 Goodman

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WE SPECIALIZE IN BUYING OUTRIGHT COMPLETE MINES THAT ARE GOING OUT OF BUSINESS OR FROM RECEIVERS IN BANKRUPTCY, ADMINISTRATORS OF ESTATES, ETC.

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### LOADING MACHINES, AC

4—6-BU Joy, 230/440

with

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Equipment

1—300 KW General

Electric

Retary

Converter

4—300 KW General

Electric

Retary

Converter

1—200 KW General

Electric

Retary

Generator Set

3—300 KW Westinghouse Motor Generator Sets

3—250 KW General Electric Motor Generator Sets

1—300 KW General Electric Retary Converter

1—100 KW General Electric Retary Converter

All above are 230/275 volt DC, 2300 volt AC, 1200 RPM,

complete with all accessories.

### CONTINUOUS MINERS

3—Joy Continuous Miners, Type AJCM-1E. Practically New. Bargain for quick sale.

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Several 3-, 4-, and 5-Truck into type steel Tipplers with all accessories.

1—Link-Belt Coal Washer, capacity 300 tons per hour.

1—McNelly-Warner Coal Washer, capacity 250 tons per hour.



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(Complete to meet your AC-DC requirements)

1 — 150 KW

3 — 200 KW

1 — 300 KW

1 — 500 KW

All 275 volts DC, 1200 rpm.

With Transformers & Switchboards  
New & rebuilt motors, 5 HP up, big discount

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American King Ball Crusher with 50 PH Slip Ring Motor 3/60/2200  
Large Steel Gear Reducers, Steam Pumps, Motors

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One Year Guarantee.

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7—Goodman G15 Shaker Conveyor Drives complete, 250 Volts D.C.  
3—Goodman G12 1/2 Shaker Conveyor Drives complete, 250 Volts D.C.  
2—250 Volt Armatures for 8-BU Joy Loader, 550—ft., 3 conductor, 1/0, 4,000 Volt lead covered cable, 1 length, new and over used.

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Three (3) La-Del Model FA Flight room conveyors, complete 300-ft. long with 7" deep pans.  
Three (3) La-Del "Combine Drive" Shaker conveyors, 2 UN17, 1 U17, 300-ft. long.  
Three (3) Goodman Dinkbills for 1 1/2 size trough, these dinkbills work with above shaker conveyors.  
Two (2) NEW 572 440V AC Chicago Pneumatic Coal Drills.  
One (1) NEW Air Circuit Breaker K-5565000101, type AA-1-15, 225 Amp., frame size 600V, 60-cycles, 2 poles, Man. oper. 150 amps. enclosed.  
One (1) 6-ton Inerton Lanthier Locomotive, height 24" above rail, 48" Gauge, CY-21 G. E. Hoist.

Will Sell Above Conveyors Less Motors.  
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Electric Motors, AC  
Electric Motors, DC  
Motor generator sets  
Transformers  
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Control Equipment



We specialize in new totally enclosed and explosion proof Motors.

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Gearhead motors  
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Also miscellaneous shovels and dozers on a rental or sales basis.

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**BARGAINS FOR SALE OR RENT****100 KW. Diesel Engine Generator Sets**

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- 2—100 kw., same as above with 220/440 V. New A.C. Generators.

**MG Sets  
250/275 V. D.C.**

KW	MAKE	RPM	VOLTS	TYPE
200	Westg.	1200	2300/4100	Ac Ind.
200	Westg.	1200	220/440	AC Syn.
150	Burke	900	2300	AC Syn.
100	Westg.	900	2300	AC Syn.
100	Delco	1200	220/440	AC Syn.

**BARGAINS — NEW AXIAL FLOW VENTILATING FANS****230 V. Direct Current**

- 25—1000 cfm. Clarage Cent. Fans 9½x7½, dir. con. 1 hp. motors.
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- 2—12,000 cfm 3" S.P. Sturtevant with dir. con. 10 HP. 2 speed motors.
- 1—35,000 cfm., 1" stat. pres. L. J. Wing dir. con. 14½ HP. TEFC motor.

**115 V. Direct Current**

- 3—500 cfm. 2.5 S.P. Buffalo
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- 1—1500 cfm. 2" S.P. Buffalo Centrifugal
- 4—2000 cfm. 2" S.P. Bayley Centrifugal Blowers.
- 1—3000 cfm. 3" S.P. American

**NEW DIESEL ENGINES**

- 140 HP. P. & H. 6 cyl. 2 cy. full diesel 1400 rpm.
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PITTSBURGH 6, PA.

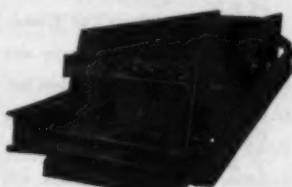
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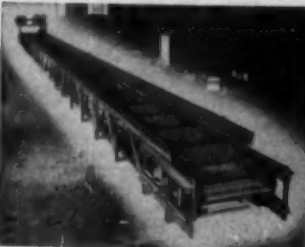
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Other scales to 50 ton capacity. All truck scales complete with structural steel weighbridges. Replacement parts for most all makes of scales.  
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- 2—150 KW GENERAL ELECTRIC Motor Generator Sets 275 V. 1200 RPM, 2300 V. 3 Ph., 60 Cy. One Full Automatic and One Semi-Automatic Switchgear.
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12"	1/16"	1/32"	28 Oz.
14"	1/16"	1/32"	28 Oz.
16"	1/8"	1/32"	28 Oz.
18"	1/8"	1/32"	28 Oz.
20"	1/8"	1/32"	28 Oz.
22"	1/8"	1/32"	28 Oz.
24"	1/8"	1/32"	28 Oz.
26"	1/8"	1/32"	28 Oz.
28"	1/8"	1/32"	28 Oz.
30"	1/8"	1/32"	28 Oz.
32"	1/8"	1/32"	28 Oz.
34"	1/8"	1/32"	28 Oz.
36"	1/8"	1/32"	28 Oz.
38"	1/8"	1/32"	28 Oz.
40"	1/8"	1/32"	28 Oz.
42"	1/8"	1/32"	28 Oz.
44"	1/8"	1/32"	28 Oz.
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- 1-24 x 24 Jeffrey Single Roll, with or without motor.
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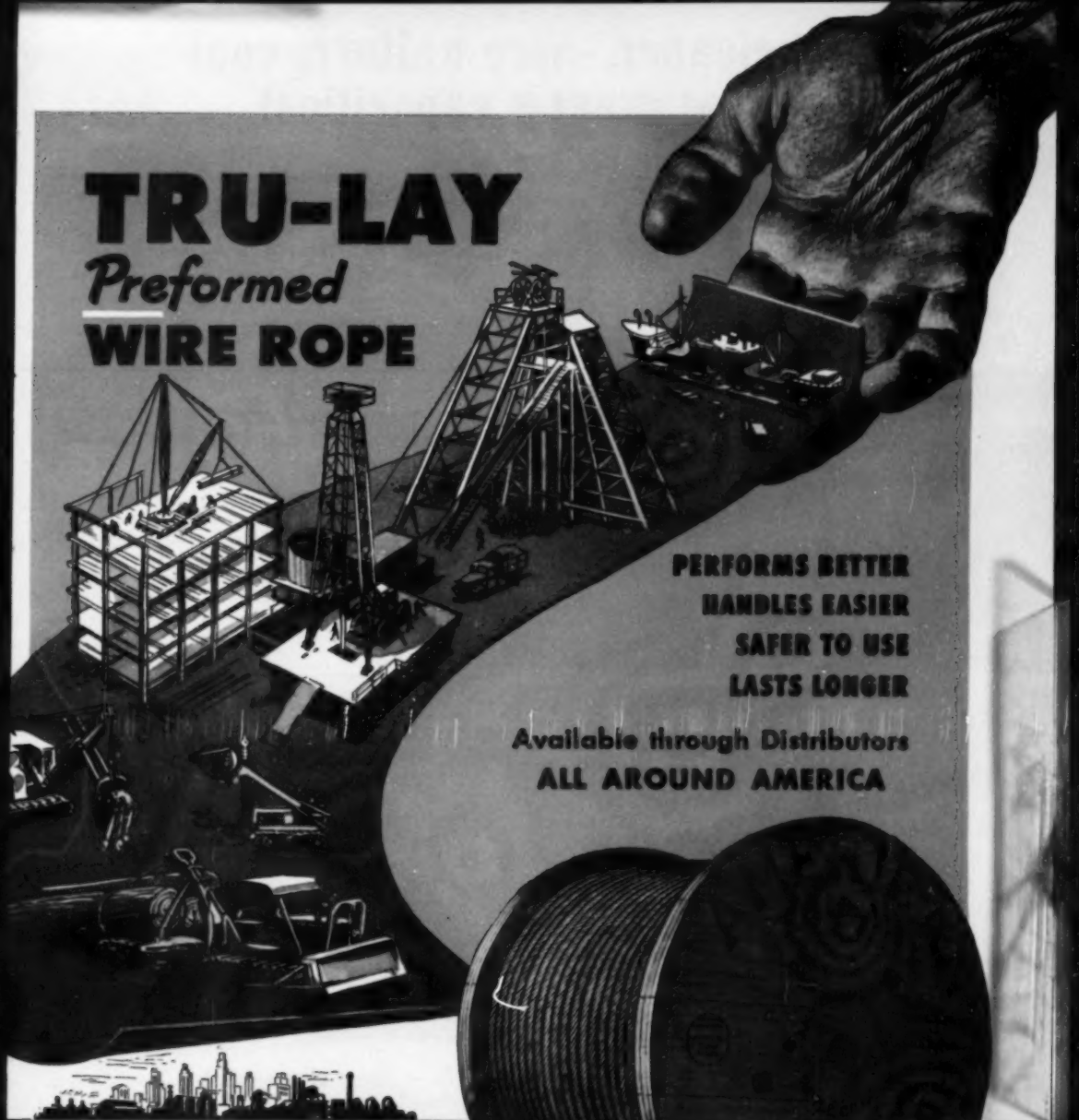
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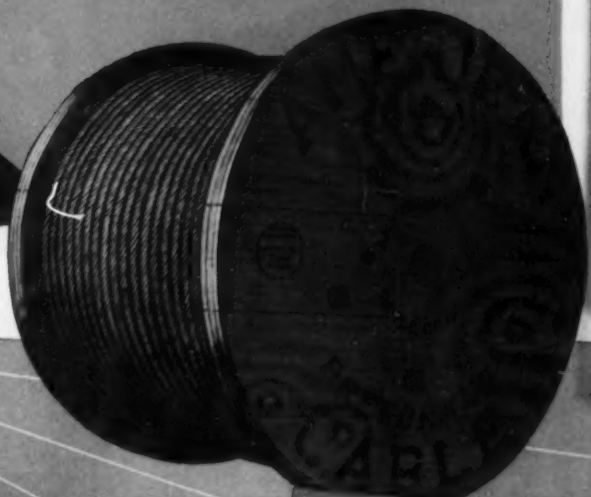
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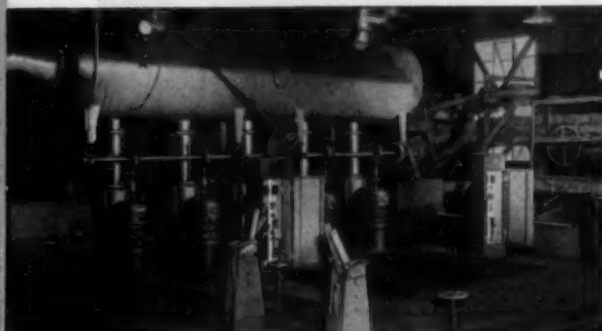
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